LANL TA-03

ENVIRONMENTAL RESTORATION PROJECT

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Date: September 25, 2002
Refer to: ER2002-0679

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SEP 2002
NMED Hazardous Waste Bureau

Mr. John Young, Corrective Action Project Leader
Permits Management Program
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505-6303

SUBJECT: SUBMITTAL OF DOCUMENTATION IN SUPPORT OF NO FURTHER ACTION (NFA) FOR 5 SOLID WASTE MANAGEMENT UNITS (SWMUs)

Dear Mr. Young:

Enclosed please find two copies of the Risk Reduction and Environmental Stewardship – Remediation Program proposal entitled "Los Alamos National Laboratory Proposal for No Further Action" (LA-UR-02-5883). The Department of Energy and the Los Alamos National Laboratory are submitting this document in support of NFA for 5 SWMUs. This proposal packet has been compiled to facilitate your evaluation of these sites prior to the submittal of a formal Class III permit modification request from the facility.

Should you have any questions regarding this proposal, please contact Linda Nonno at (505) 665-0725.

Sincerely,

David McInroy, Acting Program Manager
Environmental Restoration Project
Los Alamos National Laboratory

Sincerely,

for Everett Trollinger, Project Manager
Department of Energy
Office of Los Alamos Site Operations

DM/ET/LN/vn

Enclosure: 1) Los Alamos National Laboratory Proposal for No Further Action
2) Certification

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CERTIFICATION

CERTIFICATION BY THE ENVIRONMENTAL RESTORATION (ER) PROJECT TECHNICAL REPRESENTATIVES

Document Title: **SUBMITTAL OF DOCUMENTATION IN SUPPORT OF NO FURTHER ACTION (NFA) FOR 5 SOLID WASTE MANAGEMENT UNITS (SWMUs)**

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

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or

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Department Of Energy/Office of Los Alamos Site Operations

or

_____ Date: _____

Herman LeDoux,
Assistant Area Manager of
Environmental Projects
Department Of Energy/Office of Los Alamos Site Operations

TA-03

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ENVIRONMENTAL RESTORATION PROJECT

A Department of Energy
Environmental Cleanup Program

LA-UR-02-5883
September 2002
ER2002-0624

Los Alamos National Laboratory Proposal for No Further Action

Los Alamos
NATIONAL LABORATORY

Los Alamos NM 87545

02-019

Produced by the Regulatory Compliance Focus Area

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EXECUTIVE SUMMARY

The Los Alamos National Laboratory is proposing to the New Mexico Environment Department Hazardous Waste Bureau to remove five solid waste management units (SWMUs) from the Risk Reduction and Environmental Stewardship Division-Remediation Program (RRES-R) scope through a Class III permit modification process. RRES-R, formerly the Environmental Restoration Project, is proposing these five units based on federal and state regulations, field investigations, archival investigations, and/or site cleanups performed by RRES-R.

RRES-R has proposed each of these five SWMUs previously in a Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan, RFI report, or a voluntary corrective action completion report.

The SWMUs within this petition are proposed based on one of the following five no further action (NFA) criteria. The SWMUs currently being petitioned for removal from Module VIII are listed after their respective criterion.

NFA Criterion 1. The site does not exist; is a duplicate of another site; cannot be located, or is located within another site, and has been or will be investigated as part of that site.

SWMU 73-004(c), a reputed septic system

NFA Criterion 2. The site was never used for the management (that is, generation, treatment, storage or disposal) of RCRA solid or hazardous wastes and/or constituents.

SWMU 16-026(f), two inactive outfalls and their associated drainlines

SWMU 16-030(c), an inactive outfall and its associated drainline

NFA Criterion 3. The site is not known or suspected of releasing RCRA solid or hazardous wastes and/or constituents to the environment. The term "release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment.

No SWMUs in this petition are being proposed under NFA Criterion 3.

NFA Criterion 4. The site is regulated under another state and/or federal authority. If the site is known or suspected of releasing RCRA solid or hazardous wastes and/or constituents to the environment, it has been or will be investigated and/or remediated in accordance with the applicable state and/or federal regulations.

SWMU 03-046, an active aboveground wastewater tank

NFA Criterion 5. The site was characterized or remediated in accordance with applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

SWMU 03-011, a historical chemical carboy rinsing station

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1.0 INTRODUCTION

The Los Alamos National Laboratory (the Laboratory) is proposing to the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) to remove five solid waste management units (SWMUs) from the Risk Reduction and Environmental Stewardship Division-Remediation Program (RRES-R) scope through a Class III permit modification process. RRES-R, formerly the Environmental Restoration (ER) Project, is proposing these five units based on federal and state regulations, field investigations, archival investigations, and/or site cleanups performed by RRES-R.

The definition of a solid waste management unit used in this proposal is from Module VIII, "Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA," of the Laboratory's Hazardous Waste Facility Permit. This definition conforms to the SWMU definition presented in proposed Subpart S of the Resource Conservation and Recovery Act (RCRA) regulations in 40 CFR Part 264 (Federal Register, Vol. 55, No. 145, July 27, 1990) and was used to define SWMUs at the Laboratory. Thus, SWMUs are "any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at or around a facility at which solid wastes have been routinely and systematically released."

Each unit included in this proposal has been evaluated against applicable regulations and standards. Each unit included in this proposal is a site for which investigations and remediations (if necessary) have been completed and RRES-R has determined that no further action (NFA) is appropriate.

1.1 NFA Criteria

Within the Laboratory's RRES-R Program, there are five criteria for proposing NFA for SWMUs. The NMED-HWB, the US Department of Energy (DOE), and the Laboratory have agreed upon these criteria for determining NFA. The five NFA criteria are listed below.

NFA Criterion 1. The site does not exist; is a duplicate of another site; cannot be located, or is located within another site, and has been or will be investigated as part of that site.

NFA Criterion 2. The site was never used for the management (that is, generation, treatment, storage or disposal) of RCRA solid or hazardous wastes and/or constituents.

NFA Criterion 3. The site is not known or suspected of releasing RCRA solid or hazardous wastes and/or constituents to the environment. The term "release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment.

NFA Criterion 4. The site is regulated under another state and/or federal authority. If the site is known or suspected of releasing RCRA solid or hazardous wastes and/or constituents to the environment, it has been or will be investigated and/or remediated in accordance with the applicable state and/or federal regulations.

NFA Criterion 5. The site was characterized or remediated in accordance with applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

An administrative NFA proposal based on Criteria 1 through 3 is supported by acceptable knowledge of process and/or documented information that indicates that there has not been a release at the site, thus precluding the need for characterization and/or remediation.

An NFA proposal based on Criterion 4 is supported by acceptable knowledge of process and/or documented information that confirms that if there was a release, the site was adequately characterized and/or remediated in accordance with a regulatory authority other than that which oversees RCRA corrective action. NFA Criterion 4 is based on the fact that cleanup levels prescribed under other regulatory authorities, such as the US Environmental Protection Agency (EPA) Toxic Substances Control Act (TSCA) or New Mexico Petroleum Storage Tank (PST) regulations, were developed to incorporate human health and ecological risk considerations. Therefore, SWMUs managed in accordance with other regulatory programs normally do not require subsequent action under RCRA corrective action. However, any of the above five criteria may be supported with confirmation sampling when necessary.

An NFA proposal based on Criterion 5 is supported by data and acceptable knowledge of process and/or documented information that confirms that the site was adequately characterized and/or remediated in accordance with the Hazardous and Solid Waste Amendments of 1984 (HSWA) corrective action process.

1.2 Applicability of the Evaluation of Human Health Risk, Ecological Risk, and Other Applicable Regulations and Standards to NFA Criteria 1 Through 4

NFA proposals based on administrative NFA Criteria 1 through 3 require adequate supporting documentation to establish justification for NFA. In certain cases, Criteria 1, 2, and 3 NFA proposals may require verification samples. However, Criteria 1, 2, and 3 NFA proposals generally do not require evaluations for risks to human health or the ecosystem, or an evaluation of the applicability of other regulations and standards.

An NFA proposal based on Criterion 4 (the site was remediated in accordance with another state and/or federal authority) indicates that these SWMUs are/were characterized and managed in accordance with the requirements specified in other applicable regulations and/or standards. Other applicable regulations and standards include surface water standards, groundwater standards, air emission standards, PST regulations, and polychlorinated biphenyl (PCB) regulations. Human health and ecological risk evaluations are inherent in (or addressed by) the cleanup levels established by other regulatory authorities, such as TSCA requirements or PST regulations. Such requirements or regulations specify the human health and ecologically based cleanup levels that must be met (in the event of a release) to achieve NFA. Criterion 4 SWMUs with a confirmed release require documentation confirming that the release was cleaned to the requirements and/or standards of the applicable regulatory authority.

1.3 Organization of this Proposal

NFA proposal 1 (SWMU 03-011) is a historical chemical carboy rinsing station, characterized in 2001, and proposed under NFA Criterion 5. NFA proposal 2 is an active aboveground wastewater treatment tank (SWMU 03-046), which was withdrawn from an earlier petition for permit modification because it had been included under the wrong NFA criterion; the treatment tank is being proposed under NFA Criterion 4. NFA proposals 3 and 4 [SWMUs 16-026(f) and 16-030(c)] include inactive outfalls and their associated drainlines, which are being proposed under NFA Criterion 2. NFA proposal 5 is a reputed septic system [SWMU 73-004(c)] serving the original terminal building at the Los Alamos Airport. Although the ER Project/RRES-R used several investigation methods (including an electromagnetic geophysical survey) in order to find this septic system, the system was never located.

Each of the five NFA proposals within this document includes a description of the respective site and its operational history, current and future land use, the rationale for the proposal and the NFA criterion under which it has been proposed, a list of supporting documentation, a regulatory history, and all relevant

references. Sites proposed under NFA Criterion 5 also include a description of all relevant sampling activities, a discussion of the analytical data, a site conceptual model, and a discussion of relevant site assessments, such as human health risk, ecological risk, and surface water. In addition, documentation supporting each NFA proposal is attached at the end of each proposal. Appendix A contains a list of acronyms and abbreviations, a glossary, and a metric-to-English conversion table. Appendix B includes attachments common to more than one SWMU. Appendix C contains the supporting documentation for varying from the outline for HSWA Permit Modification Request provided in Section II.B.4.a.(4).(a) of the March 1998 Hazardous and Radioactive Materials Bureau document, "RPMP Document Requirement Guide" (NMED 1998, 57897).

Reference

NMED (New Mexico Environment Department), 1998. "RPMP Document Requirement Guide," Hazardous and Radioactive Materials Bureau, RCRA Permits Management Program, Santa Fe, New Mexico. (NMED 998, 57897)

2.0 SWMU 03-011—HISTORICAL CHEMICAL CARBOY RINSING STATION

2.1 Summary

SWMU 03-011 is a concrete pad historically used for rinsing out empty chemical carboys that had originally contained organic chemicals or acids. The rinsing station is located in the Laboratory's Technical Area (TA)-03, near a chemical warehouse (Building 03-31). Surface soil samples were collected from the area. Analytical results show that trace concentrations of residual volatile organic compounds (VOCs) are present at the SWMU. The extent of the residual contamination has been established based on decreasing levels of concentrations. Maximum contaminant levels are well below human health and ecological screening levels; thus, the low concentrations of residual contamination remaining at this site present no potential adverse impacts to human or ecological receptors. SWMU 03-011 is being proposed for NFA under NFA Criterion 5 (the site was characterized in accordance with state and/or federal regulations).

2.2 Description and Operational History

2.2.1 Site Description

SWMU 03-011 is a 10-ft x 10-ft x 6-in.-thick reinforced concrete pad that sits approximately 1 ft 6 in. above ground level (Figure 2.2-1). A water spigot is situated at the northern end of the pad (Figure 2.2-2). A 12-in. corrugated-metal pipe that runs north to south is embedded in the bottom of the pad (Figure 2.2-2). The pipe directs water from the spigot through the concrete pad into a small drainage channel that runs south approximately 55 ft into an 18-in. corrugated-metal storm water pipe that runs beneath Mercury Road (Figure 2.2-3). The 6-ft-high chain-link fence topped with barbed wire that formerly enclosed the pad has been removed from two sides of the pad. There is no staining on or around the concrete pad, and the vegetation surrounding the pad and within the drainages is healthy. An asphalt road/parking area comes into direct contact against the west side of the pad, approaches within 4 to 6 in. of the east side of the pad, and approaches within 2 ft of the north side of the pad. A small patch of vegetated soil (approximately 8 x 10 ft) lies directly adjacent to the south side of the pad and is bounded by asphalt pavement on its east, west, and south sides. This SWMU is located at the northeastern edge of TA-03 (Figure 2.2-4) approximately 100 ft southwest of Building 03-31, a chemical warehouse.

There are no other SWMUs or areas of concern (AOCs) in the immediate vicinity of SWMU 03-011.

2.2.2 Operational History

The SWMU 03-011 pad was constructed in 1956 as a station for rinsing empty chemical carboys before returning them to the vendor for reuse. A carboy is a glass or plastic bottle with a spigot. The carboys rinsed at SWMU 03-011 were of 5-gal. capacity and originally contained organic chemicals, such as toluene, or acids, such as nitric and sulfuric acids. The concrete pad was used as a rinsing station until approximately 1980. Although not documented, it is believed that from 1980 until approximately the mid-1990s, the pad was not used for any purposes. Between 1994 and 1996, the large non-PCB electric transformer that currently occupies the pad (Figure 2.2-5) was installed. No other SWMUs or AOCs are related to SWMU 03-011.

Figure 2.2-1. SWMU 03-011 concrete pad, looking east

Figure 2.2-2. North end of concrete pad showing water spigot, 12-in. pipe embedded in concrete pad, and orange sample-marker flag (behind water spigot)

Figure 2.2-3. North entrance of 18-in. corrugated-metal stormwater pipe that runs beneath Mercury Road

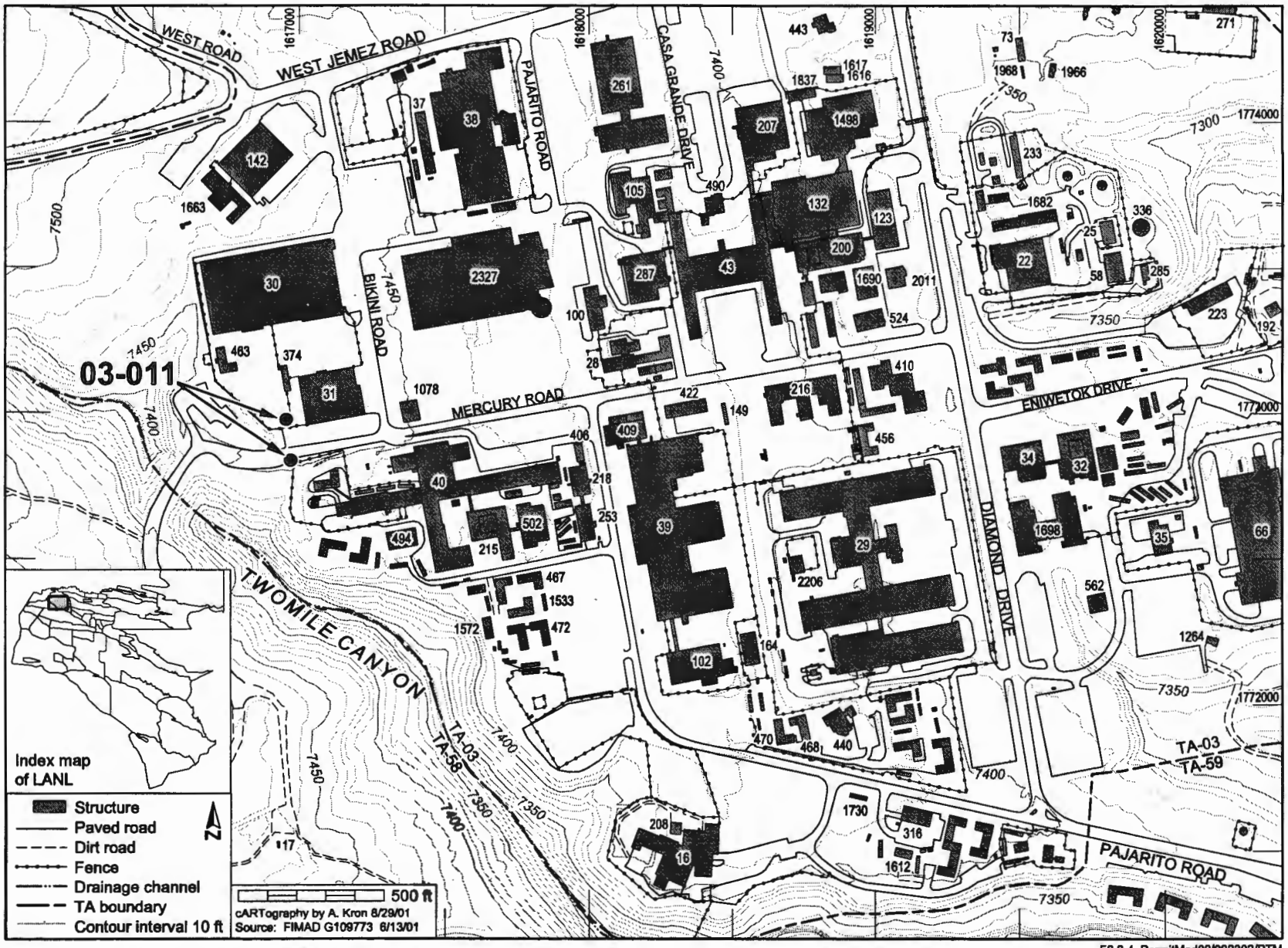

Figure 2.2-4. Location of SWMU 03-011 within TA-03

F2.2-4_PermitMod02/092302/PTM

Figure 2.2-5. Electric transformer that currently occupies the SWMU 03-011 concrete pad (looking southwest)

2.3 Land Use

2.3.1 Current

TA-03 is an industrial area containing the core of the Laboratory's operational facilities, including its principal administrative buildings, cafeteria, library, workshops, and warehouses. The location of SWMU 03-011 is contained within a limited-access area.

2.3.2 Future/Proposed

The Laboratory does not anticipate any change from industrial use with restricted access of this portion of TA-03 for the operational life of the Laboratory (LANL 1995, 57224, pp. 11–12) (Appendix B, Attachment 1).

2.4 Sampling for Nature and Extent of Contamination at SWMU 03-011

In July of 2001, the Laboratory's ER Project collected four surface soil samples at SWMU 03-011 (Figure 2.4-1) in order to determine the presence of any residual contamination at this SWMU and, if present, the nature and extent of the contamination.

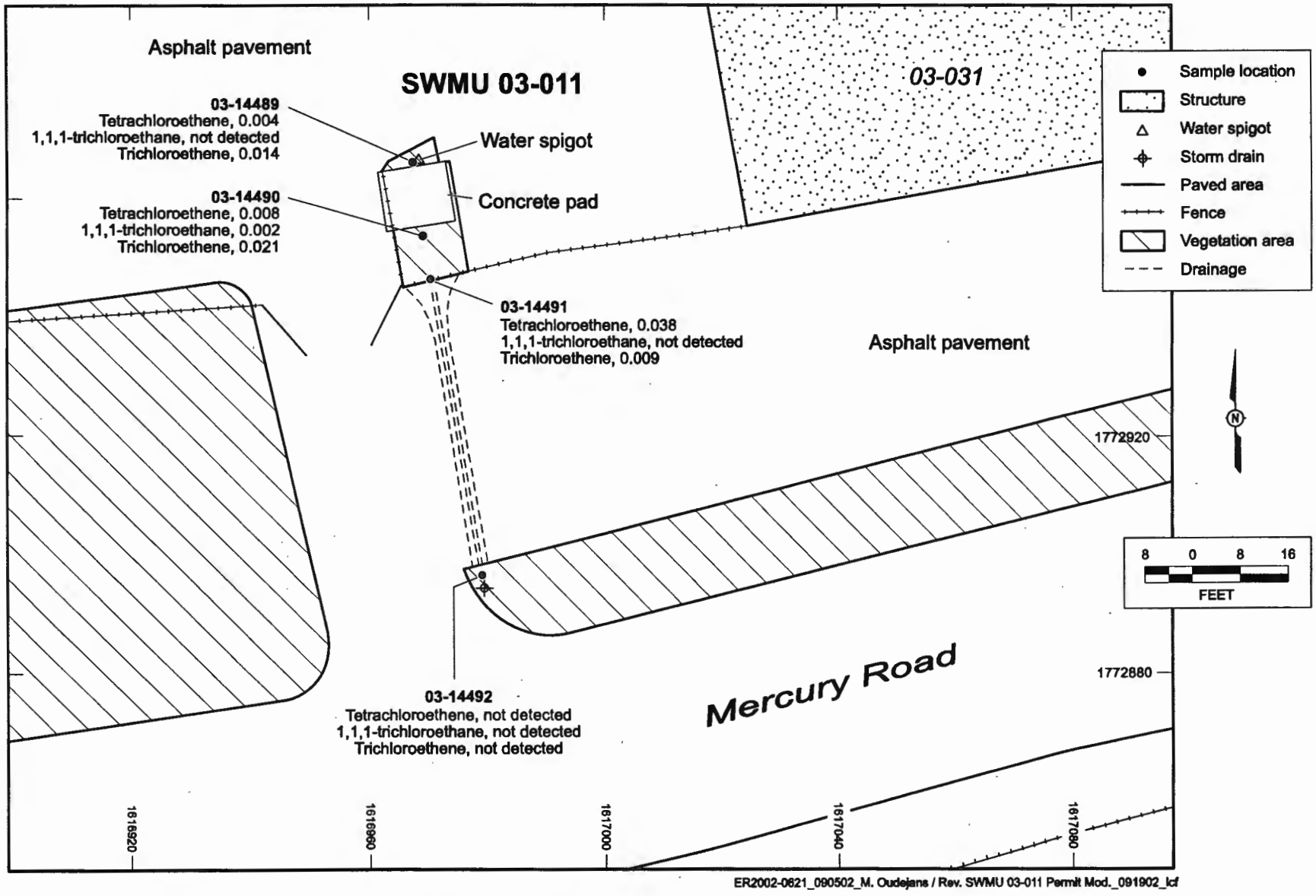

Figure 2.4-1. SWMU 03-011 soil sample locations and results

2.4.1 Nonsampling Data Collection

No field screening was considered necessary or conducted before the collection of soil samples at SWMU 03-011.

2.4.2 Sampling Data Collection

Four surface soil samples were collected from four locations at and in the vicinity of SWMU 03-011 (Figure 2.4-1). As shown in the figure, one sample was collected from directly beneath the water spigot at the north end of the concrete pad; one sample was collected adjacent to the corrugated-metal pipe outlet at the south end of the concrete pad; and two samples were collected from two locations within the 55-ft drainage channel south of the concrete pad. One of the drainage samples was collected approximately 8 ft south of the concrete pad (just north of the security fence) and one was collected at the north entrance of the 18-in. corrugated-metal storm water pipe that runs beneath Mercury Road. A summary of samples collected for SWMU 03-001 is presented in Table 2.4-1.

Table 2.4-1
Summary of Samples Collected for SWMU 03-011

Sample ID	Location ID	Depth (ft)	Media	VOCs	pH
RC03-01-0051	03-14489	0–0.5	soil	9441R*	9442R
RC03-01-0052	03-14490	0–0.5	soil	9441R	9442R
RC03-01-0053	03-14491	0–0.5	soil	9441R	9442R
RC03-01-0054	03-14492	0–0.5	soil	9441R	9442R

*Sample request number.

2.4.3 Data Gaps

There were no data gaps associated with the data collection at SWMU 03-011. Sufficient data were collected to adequately determine nature and extent of contamination based on decreasing levels of concentrations as the distance from the concrete pad increased.

2.4.4 Results and Conclusions

The surface soil samples collected for SWMU 03-011 were submitted for fixed-laboratory analytical analysis of pH and VOCs. Analytical results are summarized in Table 2.4-2. A summary of detected concentrations are presented in Table 2.4-3 and in Figure 2.4-1. Analytical results in their entirety are included as Attachment A of this proposal.

Table 2.4-2
Frequency of Detected Chemicals for SWMU 03-011

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)*	Frequency of Detects
Tetrachloroethene	soil	4	3	0.004 to 0.038	3/4
Trichloroethane [1,1,1-]	soil	4	1	0.002 to [0.006]	1/4
Trichloroethene	soil	4	3	[0.006] to 0.021	3/4

*Values in brackets indicate non-detects.

Table 2.4-3
Summary of Detected Chemicals for SWMU 03-011

Analyte	Location ID Number	Sample ID Number	Concentration (mg/kg)	Media	Depth (ft)
Tetrachloroethene	03-14489	RC03-01-0051	0.004 (J)*	soil	0–0.5
Tetrachloroethene	03-14490	RC03-01-0052	0.008	soil	0–0.5
Tetrachloroethene	03-14491	RC03-01-0053	0.038	soil	0–0.5
Trichloroethane [1,1,1-]	03-14490	RC03-01-0052	0.002 (J)	soil	0–0.5
Trichloroethene	03-14489	RC03-01-0051	0.014	soil	0–0.5
Trichloroethene	03-14490	RC03-01-0052	0.021	soil	0–0.5
Trichloroethene	03-14491	RC03-01-0053	0.009	soil	0–0.5

*J = The reported value is an estimate of the sample-specific detection or quantitation limit.

VOC concentrations were measured to determine if rinsing carboys that had formerly contained VOCs had contaminated the soil at SWMU 03-011. The three detected VOCs (tetrachloroethene, 1,1,1-trichloroethane, and trichloroethene) are chemicals of potential concern (COPCs) and must be evaluated in human health and ecological screening assessments. The results of the human health and ecological screening assessments conducted for these contaminants are discussed in Sections 2.6.1.1 and 2.6.1.2, respectively, of this proposal.

Soil pH concentrations were measured to determine if the soil at SWMU 03-011 had been contaminated by former rinsing activities at this SWMU, specifically those that included rinsing carboys that had formerly contained acids. A normal soil pH range of 5.2 to 8.2 was established for soils at the Laboratory in "Natural Background Geochemistry, Geomorphology, and Pedogenesis of Selected Soil Profiles and Bandelier Tuff, Los Alamos, New Mexico" (LANL 1996, 55115) (relevant pages included as Attachment B). For the Laboratory, soil concentrations below a pH of 5 are considered acidic. The pH concentrations measured in the four soil samples at SWMU 03-011 ranged from 6.0 to 7.9, within the normal pH range for the Laboratory, thus indicating no acid contamination.

2.5 Site Conceptual Model

SWMU 03-011 received wastewater from the rinsing of empty chemical carboys. Because the carboys were empty, the wastewater would contain only trace amounts of VOCs in relatively acidic rinse water. The primary release of contaminants was by deposition of poured rinse water on the surface of the concrete pad. The acidic nature of the rinse water would be buffered by the native soils, which have a relatively neutral pH (see Section 2.4.4). Because of their physiochemical properties, the VOCs released from carboy rinsing activities would have volatized into the atmosphere and/or been solubilized in water and transported down the drainage. There is a decline in elevation from north, east, and west to south at this SWMU. The slope would cause wastewater from carboy-rinsing activities to flow southward. The wastewater would have flowed off the pad directly into the small natural drainage located immediately south of the pad, eventually reaching the storm drain at Mercury Road. However, some carboys may have been rinsed directly beneath the spigot, causing wastewater to first flow through the corrugated-metal pipe embedded in the concrete pad and then into the drainage south of the pad. Based on the direction of wastewater flow, the SWMU 03-011 site conceptual model for releases assumes that the area directly under the water faucet at the north end of the pad, the area directly beneath the southern end of the 12-in. pipe embedded in the concrete pad, and the natural drainage located immediately south of the

pad would contain the maximum concentrations of contaminants. Sampling results confirmed that the contaminant concentrations in the drainage decreased southward toward Mercury Road as the distance from the concrete pad increased and that the residual VOC contamination remaining at this site is at trace levels and that soil pH was not affected.

2.5.1 Nature and Extent of Contamination

Because of the historical carboy rinsing operations conducted at this SWMU, the nature of the contamination was known to be from VOCs. The site conceptual model for releases assumed that because empty carboys were rinsed at this station, only trace amounts of VOCs were contained in the wastewater; that the VOCs released from carboy rinsing activities would have volatized into the atmosphere and/or been transported down the drainage; and that any residual VOC contamination remaining at this site would be found only at trace levels. The SWMU 03-011 sampling results support these assumptions; maximum concentrations of VOCs are extremely low (0.038 mg/kg for tetrachloroethene; 0.002 mg/kg for 1,1,1-trichloroethane, and 0.021 mg/kg for trichloroethene). A visit to the site following a heavy rainfall event also supported these assumptions. No pools of water were present in the small patches of vegetated soil that lie directly adjacent to the north and south sides of the concrete pad, indicating that all stormwater is transported down the drainage and confirming that the wastewater from rinsing activities also would not have pooled in the north and south vegetated areas, but have been transported down the drainage.

The samples collected at SWMU 03-011 were from the areas beneath the faucet, at the south end of the corrugated metal pipe embedded in the concrete pad, and downgradient (south) from the corrugated metal pipe outfall. The site conceptual model for releases assumed that the areas beneath the faucet and beneath the south end of the corrugated metal pipe would contain the maximum concentrations of contaminants and that concentrations would decrease as the distance from the outfall increased. The SWMU 03-011 sampling results support this assumption; concentrations of VOCs are highest directly below the outfall pipe and decrease southward in downgradient samples until, ultimately, no VOCs were detected. Because of the volatile nature of the contaminants (VOCs) and the intended design of the operation to discharge releases to the drainage channel so that the wastewater would be transported laterally away from the site, sampling for extent of contamination beneath the SWMU is not warranted. The lack of standing water following heavy rainfalls substantiates the lateral rather than vertical movement of water at this site. Therefore, the extent of contamination from releases at this SWMU is defined.

2.5.2 Environmental Fate

The physiochemical properties of detected VOCs cause them to volatilize into the air over time. They are also water-soluble and would be transported by surface water runoff. Given the trace levels at which residual VOCs were detected in the soil at SWMU 03-011, it is unlikely that they would have migrated off-site. This is verified by the southern-most sample collected downgradient from the concrete pad at the north entrance of the 18-in. corrugated metal stormwater pipe that runs beneath Mercury Road. No VOCs were detected in this sample.

2.6 Site Assessments

2.6.1 Screening Assessments

The three VOCs present in the soil at SWMU 03-011 (tetrachloroethene, 1,1,1-trichloroethane, and trichloroethene) are COPCs evaluated in the human health and ecological screening assessments that

follow. (Analytical results for samples collected at SWMU 03-011 are summarized in Figure 2.4-1 and included in their entirety as Attachment A of this proposal.)

2.6.1.1 Human Health

In the human health screening assessment, COPCs are compared with screening action levels (SALs), which are based on a residential scenario. The SALs were calculated according to the approach presented in the document "Human Health Risk-Based Screening Methodology" (Environmental Restoration Project 2002, 72639) and based on the guidance provided by NMED (2000, 68554) and EPA Region 6 (EPA 2001, 71466).

Table 2.6-1 presents a comparison of the maximum detected values for each analyte detected at SWMU 03-011 with its SAL. The maximum concentration of 1,1,1-trichloroethane divided by its SAL results in a hazard quotient (HQ) of 0.000004, which is below the NMED target level of 1.0. The calculated total cancer risk for tetrachloroethene and trichloroethene is 2×10^{-8}, which is less than NMED's target cancer risk level of 1×10^{-5}.

Table 2.6-1
Comparison of Maximum Detected Soil Concentrations with SALs for SWMU 03-011

Analyte	Location ID Number	Sample ID Number	Depth (ft)	Maximum Value (mg/kg)	SAL (mg/kg)
Noncarcinogens					
1,1,1-Trichloroethane	03-14490	RC03-01-0052	0–0.5	0.002	510
Carcinogens					
Tetrachloroethene	03-14491	RC03-01-0053	0–0.5	0.038	4.9
Trichloroethene	03-14490	RC03-01-0052	0–0.5	0.021	1.6

Thus the screening assessment verifies that the residual concentrations of COPCs at SWMU 03-011 pose no potential unacceptable risk to human health.

2.6.1.2 Ecological

The complete ecological screening assessment for SWMU 03-011 is included as Attachment C. A summary is presented in this section.

The purpose of the ecological screening evaluation is to identify chemicals of potential ecological concern (COPECs) and not to calculate risk. The evaluation involves the calculation of HQs and hazard indices (HIs) for all COPCs identified in the data review for all appropriate screening receptors as described in "Screening Level Ecological Risk Assessment Methods" (LANL 1999, 64783). The HQ analysis is based on the exposure concentration (i.e., maximum detected concentration) for each COPC and is calculated by dividing these values by the soil ecological screening levels (ESLs) for the screening receptors (plant, earthworm, deer mouse, vagrant shrew, desert cottontail, American robin [herbivore, omnivore, insectivore], American kestrel [with and without an all meat diet], and fox). The ESLs for this assessment were obtained from the ECORISK database, version 1.4 (LANL 2002, 72802.1). If the maximum HQ resulting from this comparison is greater than 0.3, a more detailed HI analysis is conducted for that chemical to determine if the potential for adverse ecological impacts exists and to determine the overall contribution of the chemical to the HI for each receptor. An HI is the sum of HQs across contaminants

with like effects for a given screening receptor. The chemicals resulting in an HQ greater than 1.0 or contributing more than 0.3 to an HI greater than 1.0 are identified as COPECs.

Table 2.6-2 presents a comparison of the maximum detected values for tetrachloroethene, 1,1,1-trichloroethane, and trichloroethene to the minimum terrestrial ESL for each analyte detected at SWMU 03-011.

Table 2.6-2
Maximum Detected Soil Concentrations and ESLs for SWMU 03-011

Analyte	Maximum Value (mg/kg)	Minimum ESL (mg/kg)	Receptor	HQ*
Tetrachloroethene	0.038	3.8	Deer mouse	0.01
Trichloroethane [1,1,1-]	0.002	2500	Deer mouse	0.0000008
Trichloroethene	0.021	1.9	Deer mouse	0.01

*HQ = maximum detected concentration divided by the minimum ESL.

Because the maximum HQ for each of the three VOCs detected at SWMU 03-011 is less than 0.3, none of these residual contaminants are considered to be COPECs. Therefore, there is no potential risk to ecological receptors from the trace levels of residual contamination remaining at SWMU 03-011.

2.6.2 Risk Assessments

2.6.2.1 Human Health

Based on the elimination of all COPCs in the human health screening assessment for SWMU 03-011, no human health risk assessment was necessary.

2.6.2.2 Ecological

Based on the elimination of all COPECs in the ecological screening assessment for SWMU 03-011, no ecological risk assessment was necessary.

2.6.3 Other Applicable Assessments

2.6.3.1 Surface Water

RRES-R has developed a procedure to assess sediment transport and erosion concerns at individual SWMUs. It provides a basis for prioritizing and scheduling actions to control the erosion of potentially contaminated soils at specific SWMUs. The procedure is a two-part evaluation. Part A is a compilation of existing analytical data for the SWMU, site maps, and knowledge-of-process information. Part B is an assessment of the erosion/sediment transport potential at a SWMU. Erosion potential is numerically rated from 1 to 100 using a matrix system. SWMUs that score below 40 have low erosion potential; those that score from 40 to 60 have medium erosion potential; and those that score above 60 have high erosion potential.

A surface water assessment for SWMU 03-011 was conducted on July 29, 1997. The assessment resulted in an erosion matrix score of 38.6, indicating that the site has a low potential for erosion. The assessment found no debris in any nearby watercourse. There are no wetlands or springs in the vicinity

of SWMU 03-011. Thus, the results of the surface water assessment indicate little potential for contaminant transport by surface water or sediment. (Attachment D)

2.6.3.2 Groundwater

SWMU 03-011 presents no potential pathway for contaminant release to groundwater. The regional aquifer is approximately 875 ft to 1100 ft below the ground surface at TA-03 and well below the vertical extent of contamination at 03-011. There are no active or inactive local water supplies and no production wells in the vicinity of SWMU 03-011.

2.7 No Further Action Proposal

2.7.1 Rationale

Surface soil samples were collected at SWMU 03-011 in July 2001. Analytical results indicated residual trace levels of three VOCs (tetrachloroethene, 1,1,1-trichloroethane, and trichloroethene). Human health and ecological screening assessments verified that residual contamination is at concentrations that pose no potential unacceptable level of risk.

Therefore, RRES-R is proposing SWMU 03-011 for NFA because

- the nature and extent of contamination for this SWMU was adequately defined and
- the residual trace levels of contamination at this SWMU pose no potential unacceptable risk to human health or potential adverse impacts to ecological receptors as reported within Section 2.6 of this proposal.

2.7.2 Criterion

Based on the information presented in Sections 2.2 through 2.4, SWMU 03-011 is being proposed for NFA under Criterion 5.

2.8 Supporting Documentation Attached

Attachment A: Analytical results.

Attachment B: Relevant pages from "Natural Background Geochemistry, Geomorphology, and Pedogenesis of Selected Soil Profiles and Bandelier Tuff, Los Alamos, New Mexico." (LANL 1996, 55115)

Attachment C: Budd memo to file, ecological screening for SWMU 03-011. (Budd 2002, 73457)

Attachment D: LANL surface water assessment for SWMU 03-011.

Appendix B, Attachment 1: LANL site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

2.9 References Used for Text of the Proposal for Permit Modification for SWMU 03-011

LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory report LA-UR-95-731, Los Alamos, New Mexico, p. 6-4. (LANL 1995, 57590)

LANL (Los Alamos National Laboratory), May 1996. "Natural Background Geochemistry, Geomorphology, and Pedogenesis of Selected Soil Profiles and Bandelier Tuff, Los Alamos, New Mexico," Los Alamos National Laboratory manuscript LA-12913-MS, Los Alamos, New Mexico, pp. 25–26. (LANL 1996, 55115)

LANL (Los Alamos National Laboratory), July 12, 2001. "Confirmation Sampling and Analysis Plan, PRS 3-011 - Former Chemical Carboy Rinsing Area and Drainage, TA-3 (Former Operable Unit 1114)," Los Alamos, New Mexico. (LANL 2001, 73458)

References Cited in Text

Environmental Restoration Project, April 2002. "Human Health Risk-Based Screening Methodology," Los Alamos National Laboratory report LA-UR-02-1563, Los Alamos, New Mexico. (Environmental Restoration Project 2002, 72639)

EPA (US Environmental Protection Agency), November 2001. "EPA Region 6 Human Health Medium-Specific Screening Levels," Dallas Texas. (EPA 2001, 71466)

LANL (Los Alamos National Laboratory), March 2002. "LANL ECORISK Database, Version 1.4," Los Alamos National Laboratory CD ROM, LANL ER Records Package 186, Los Alamos, New Mexico. (LANL 2002, 72802.1)

LANL (Los Alamos National Laboratory), December 1999. "Screening Level Ecological Risk Assessment Methods," Revision 1, Los Alamos National Laboratory report LA-UR-99-1405, Los Alamos, New Mexico. (LANL 1999, 64783)

NMED (New Mexico Environment Department), December 2000. "NMED Hazardous Waste and Ground Water Bureaus Voluntary Remediation Program, Technical Background Document for the Development of Soil Screening Levels (Volume I)," Santa Fe, New Mexico. (NMED 2000, 68554)

2.10 History of Regulatory Deliverables

LANL, July 1995:	RFI work plan for OU 1114, Addendum 1 submitted to EPA. (LANL 1995, 57590)
EPA, November 1, 1995:	NOD for OU 1114 RFI work plan, Addendum 1. (EPA 1995, 55161.49)
LANL, February 8, 1996:	Response to NOD for OU 1114 RFI work plan, Addendum 1. (LANL 1996, 54088)
NMED, August 26, 1996:	Disapprovals of OU 1114 RFI work plan [Addendum 1] and LANL response to NOD. (NMED 1996, 65591)
LANL, November 6, 1996:	Request for clarification of disapproval letter for NOD response for RFI work plan for OU 1114, Addendum 1. (LANL 1996, 55188)

2.10.1 References for Regulatory Deliverables

LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory report LA-UR-95-731, Los Alamos, New Mexico, p. 6-4. (LANL 1995, 57590)

EPA (US Environmental Protection Agency), November 1, 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory (NM0890010515)," US Environmental Protection Agency (Region 6) letter to T. Taylor (DOE Program Manager) from D. W. Neleigh (EPA Region 6 Chief, New Mexico Federal Facilities Section), Dallas, Texas. (EPA 1995, 55161.49)

LANL (Los Alamos National Laboratory), February 8, 1996. "Response to the Notice of Deficiency for the RFI Work Plan for Operable Unit 1114, Addendum 1," Field Unit 1, Los Alamos National Laboratory report, Los Alamos, New Mexico. (LANL 1996, 54088)

NMED (New Mexico Environment Department), August 26, 1996. "Disapproval of the RCRA Facility Investigation Work Plan for Operable Unit 1114, Los Alamos National Laboratory (NM0890010515)," NMED letter to G.T. Todd (DOE-LAAO) from E. Kelley (NMED-HRMB), Santa Fe, New Mexico. (NMED 1996, 65591)

LANL (Los Alamos National Laboratory), November 6, 1996. "Clarification Request for the EPA Disapproval Letter for OU 1114 RFI Work Plan, Addendum 1, NOD Response," Los Alamos National Laboratory letter EM/ER:96-573 to E. Kelley (NMED-HRMB) from J. Jansen (LANL ER Program) and T. Taylor (DOE-LAAO), Los Alamos, New Mexico. (LANL 1996, 55188)

03-011

ATTACHMENTS

Attachment A
03-011

Table C-1
All Analytical Data for SWMU 03-011

PRS	Location ID	Sample ID	Depth	Eval. Class	Analyte	Result	Units	Report Qualifier
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Acetone	0.019	MG/KG	U[a]
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Benzene	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Bromobenzene	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Bromochloromethane	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Bromodichloromethane	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Bromoform	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Bromomethane	0.012	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Butanone[2-]	0.024	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Butylbenzene[n-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Butylbenzene[sec-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Butylbenzene[tert-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Carbon Disulfide	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Carbon Tetrachloride	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Chlorobenzene	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Chlorodibromomethane	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Chloroethane	0.012	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Chloroform	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Chloromethane	0.012	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Chlorotoluene[2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Chlorotoluene[4-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dibromo-3-Chloropropane[1,2-]	0.012	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dibromoethane[1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dibromomethane	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichlorobenzene[1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichlorobenzene[1,3-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichlorobenzene[1,4-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichlorodifluoromethane	0.012	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloroethane[1,1-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloroethane[1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloroethene[1,1-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloroethene[cis-1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloroethene[trans-1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloropropane[1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloropropane[1,3-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloropropane[2,2-]	0.006	MG/KG	UJ[b]
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloropropene[1,1-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloropropene[cis-1,3-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Dichloropropene[trans-1,3-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Ethylbenzene	0.006	MG/KG	U

Table C-1
All Analytical Data for SWMU 03-011

PRS	Location ID	Sample ID	Depth	Eval. Class	Analyte	Result	Units	Report Qualifier
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Hexanone[2-]	0.024	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Iodomethane	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Isopropylbenzene	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Isopropyltoluene[4-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Methyl-2-pentanone[4-]	0.024	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Methylene Chloride	0.014	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Propylbenzene[1-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Styrene	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Tetrachloroethane[1,1,1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Tetrachloroethane[1,1,2,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Tetrachloroethene	0.004	MG/KG	J[c]
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Toluene	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Trichloroethane[1,1,1-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Trichloroethane[1,1,2-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Trichloroethene	0.014	MG/KG	None
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Trichlorofluoromethane	0.002	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Trichloropropane[1,2,3-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Trimethylbenzene[1,2,4-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Trimethylbenzene[1,3,5-]	0.006	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Vinyl Chloride	0.012	MG/KG	U
03-011	03-14489	RC03-01-0051	0-0.5 FT	ALLH	Xylene (Total)	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Acetone	0.016	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Benzene	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Bromobenzene	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Bromochloromethane	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Bromodichloromethane	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Bromoform	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Bromomethane	0.011	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Butanone[2-]	0.022	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Butylbenzene[n-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Butylbenzene[sec-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Butylbenzene[tert-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Carbon Disulfide	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Carbon Tetrachloride	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Chlorobenzene	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Chlorodibromomethane	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Chloroethane	0.011	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Chloroform	0.006	MG/KG	U

Table C-1
All Analytical Data for SWMU 03-011

PRS	Location ID	Sample ID	Depth	Eval. Class	Analyte	Result	Units	Report Qualifier
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Chloromethane	0.011	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Chlorotoluene[2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Chlorotoluene[4-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dibromo-3-Chloropropane[1,2-]	0.011	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dibromoethane[1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dibromomethane	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichlorobenzene[1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichlorobenzene[1,3-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichlorobenzene[1,4-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichlorodifluoromethane	0.011	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloroethane[1,1-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloroethane[1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloroethene[1,1-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloroethene[cis-1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloroethene[trans-1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloropropane[1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloropropane[1,3-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloropropane[2,2-]	0.006	MG/KG	UJ
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloropropene[1,1-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloropropene[cis-1,3-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Dichloropropene[trans-1,3-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Ethylbenzene	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Hexanone[2-]	0.022	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Iodomethane	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Isopropylbenzene	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Isopropyltoluene[4-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Methyl-2-pentanone[4-]	0.022	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Methylene Chloride	0.01	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Propylbenzene[1-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Styrene	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Tetrachloroethane[1,1,1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Tetrachloroethane[1,1,2,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Tetrachloroethene	0.008	MG/KG	None
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Toluene	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Trichloroethane[1,1,1-]	0.002	MG/KG	J
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Trichloroethane[1,1,2-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Trichloroethene	0.021	MG/KG	None
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Trichlorofluoromethane	0.006	MG/KG	U

Table C-1
All Analytical Data for SWMU 03-011

PRS	Location ID	Sample ID	Depth	Eval. Class	Analyte	Result	Units	Report Qualifier
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Trichloropropane[1,2,3-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Trimethylbenzene[1,2,4-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Trimethylbenzene[1,3,5-]	0.006	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Vinyl Chloride	0.011	MG/KG	U
03-011	03-14490	RC03-01-0052	0-0.5 FT	ALLH	Xylene (Total)	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Acetone	0.021	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Benzene	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Bromobenzene	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Bromochloromethane	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Bromodichloromethane	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Bromoform	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Bromomethane	0.012	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Butanone[2-]	0.024	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Butylbenzene[n-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Butylbenzene[sec-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Butylbenzene[tert-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Carbon Disulfide	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Carbon Tetrachloride	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Chlorobenzene	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Chlorodibromomethane	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Chloroethane	0.012	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Chloroform	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Chloromethane	0.012	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Chlorotoluene[2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Chlorotoluene[4-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dibromo-3-Chloropropane[1,2-]	0.012	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dibromoethane[1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dibromomethane	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichlorobenzene[1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichlorobenzene[1,3-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichlorobenzene[1,4-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichlorodifluoromethane	0.012	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloroethane[1,1-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloroethane[1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloroethene[1,1-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloroethene[cis-1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloroethene[trans-1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloropropane[1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloropropane[1,3-]	0.006	MG/KG	U

Table C-1
All Analytical Data for SWMU 03-011

PRS	Location ID	Sample ID	Depth	Eval. Class	Analyte	Result	Units	Report Qualifier
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloropropane[2,2-]	0.006	MG/KG	UJ
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloropropene[1,1-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloropropene[cis-1,3-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Dichloropropene[trans-1,3-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Ethylbenzene	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Hexanone[2-]	0.024	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Iodomethane	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Isopropylbenzene	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Isopropyltoluene[4-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Methyl-2-pentanone[4-]	0.024	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Methylene Chloride	0.01	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Propylbenzene[1-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Styrene	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Tetrachloroethane[1,1,1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Tetrachloroethane[1,1,2,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Tetrachloroethene	0.038	MG/KG	None
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Toluene	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Trichloroethane[1,1,1-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Trichloroethane[1,1,2-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Trichloroethene	0.009	MG/KG	None
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Trichlorofluoromethane	0.001	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Trichloropropane[1,2,3-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Trimethylbenzene[1,2,4-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Trimethylbenzene[1,3,5-]	0.006	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Vinyl Chloride	0.012	MG/KG	U
03-011	03-14491	RC03-01-0053	0-0.5 FT	ALLH	Xylene (Total)	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Acetone	0.017	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Benzene	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Bromobenzene	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Bromochloromethane	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Bromodichloromethane	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Bromoform	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Bromomethane	0.012	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Butanone[2-]	0.024	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Butylbenzene[n-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Butylbenzene[sec-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Butylbenzene[tert-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Carbon Disulfide	0.006	MG/KG	U

Table C-1
All Analytical Data for SWMU 03-011

PRS	Location ID	Sample ID	Depth	Eval. Class	Analyte	Result	Units	Report Qualifier
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Carbon Tetrachloride	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Chlorobenzene	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Chlorodibromomethane	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Chloroethane	0.012	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Chloroform	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Chloromethane	0.012	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Chlorotoluene[2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Chlorotoluene[4-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dibromo-3-Chloropropane[1,2-]	0.012	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dibromoethane[1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dibromomethane	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichlorobenzene[1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichlorobenzene[1,3-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichlorobenzene[1,4-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichlorodifluoromethane	0.012	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloroethane[1,1-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloroethane[1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloroethene[1,1-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloroethene[cis-1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloroethene[trans-1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloropropane[1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloropropane[1,3-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloropropane[2,2-]	0.006	MG/KG	UJ
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloropropene[1,1-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloropropene[cis-1,3-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Dichloropropene[trans-1,3-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Ethylbenzene	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Hexanone[2-]	0.024	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Iodomethane	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Isopropylbenzene	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Isopropyltoluene[4-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Methyl-2-pentanone[4-]	0.024	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Methylene Chloride	0.013	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Propylbenzene[1-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Styrene	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Tetrachloroethane[1,1,1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Tetrachloroethane[1,1,2,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Tetrachloroethene	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Toluene	0.006	MG/KG	U

Table C-1
All Analytical Data for SWMU 03-011

PRS	Location ID	Sample ID	Depth	Eval. Class	Analyte	Result	Units	Report Qualifier
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Trichloroethane[1,1,1-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Trichloroethane[1,1,2-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Trichloroethene	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Trichlorofluoromethane	0.001	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Trichloropropane[1,2,3-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Trimethylbenzene[1,2,4-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Trimethylbenzene[1,3,5-]	0.006	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Vinyl Chloride	0.012	MG/KG	U
03-011	03-14492	RC03-01-0054	0-0.5 FT	ALLH	Xylene (Total)	0.006	MG/KG	U

[a] U = The analyte was analyzed for, but not detected.

[b] UJ = The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.

[c] J = The reported value is an estimate of the sample-specific detection or quantitation limit.

LA-12913-MS

UC-903
Issued: May 1996

Attachment B
03-011

Natural Background Geochemistry, Geomorphology, and Pedogenesis of Selected Soil Profiles and Bandelier Tuff Los Alamos, New Mexico

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Figure 13 is a bivariate plot of clay-size material *vs* Fe content for all of the B horizons sampled during the study. The correlation ($r^2 = 0.72$) between these two variables is good—suggesting that iron oxides probably occur as coatings and intergrowths with clay minerals—which is consistent with mineralogical results reported by Sposito (1989) and McBride (1994). The dominant Fe-bearing phases occurring in the Pajarito Plateau soils probably include amorphous $Fe(OH)_3$, goethite (α-FeOOH), and hematite (α-Fe_2O_3); however, the exact mineralogy has not been determined from XRD analyses. These phases have been reported in numerous soils characterized worldwide (Sposito, 1989; Dixon and Weed, 1990).

Soil pH

Laboratory-determined soil pH values range from 5.2 (for a sample obtained from an O horizon at Site 4, Twomile Mesa at TA-69) to 8.2 (for a sample collected from a carbonate-rich zone at Site 5, Water Tanks Trench, TA-16 (Watt and McFadden, 1992). Solid organic carbon, possibly present as humic and fulvic acids, is concentrated in O and A horizons containing carboxylic acids that deprotonate under moderately acidic (4.5) conditions. Other organic acids with pka ($-\log_{10} K_{acid}$)values ranging from 3 to 7 may also control soil pH within the O and A horizons. This deprotonation results in acidic pH conditions within O and A horizons. In addition, enhanced biological activity

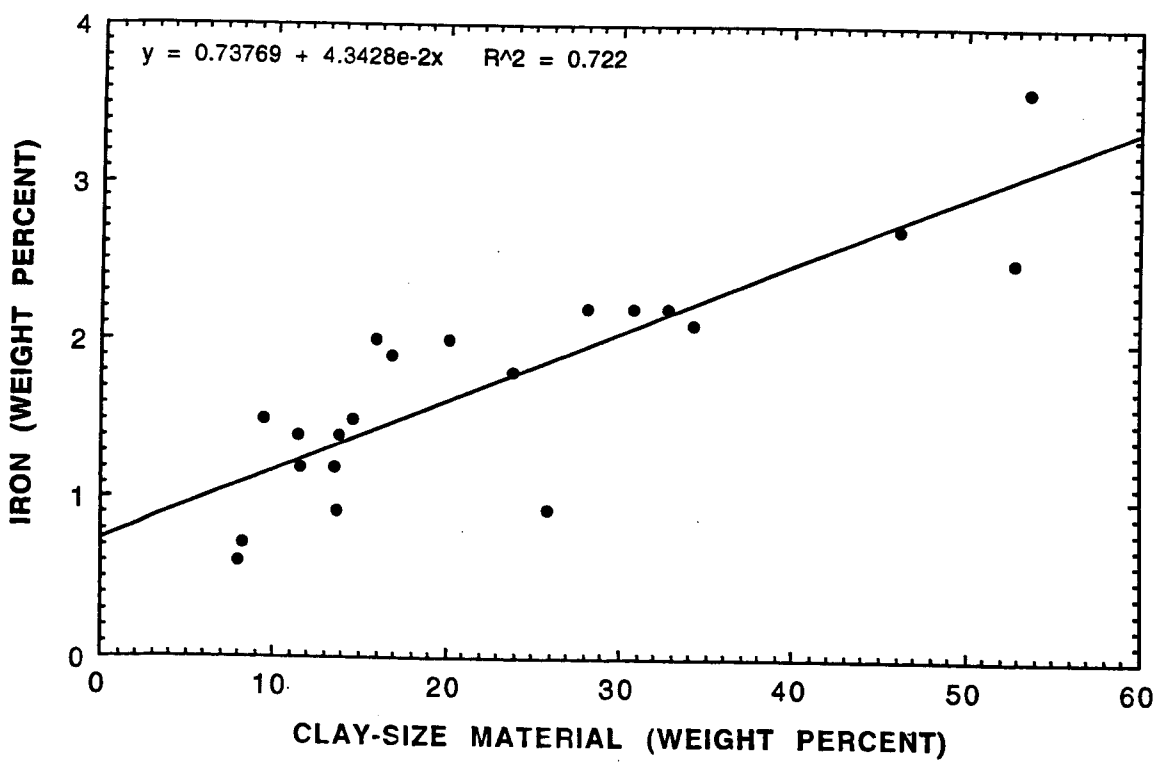


Fig. 13. Clay-size material vs Fe concentration in B horizons, background soils, Los Alamos., New Mexico.

in O horizons produces a high partial pressure of CO_2 gas, which reacts with soil-pore water and thereby decreases soil pH. Poorly developed soils at Laboratory sites tend to have lower pH values (5.4 to 6.5) in the absence of carbonate horizons; well-developed soils have higher pH values (7.0 to 8.2), which are primarily attributed to the presence of calcium carbonate (K) horizons. The B horizons at the Laboratory tend to show variability in pH values (5.4 to 7.9) but also tend to be dominantly characterized by alkaline pH values. Soil pH in pore waters of the B, C, and K horizons is dominantly controlled by calcium carbonate and partial pressure of CO_2 gas (Sposito, 1989; Drever, 1988). Soil pH is an important parameter that controls precipitation/dissolution and adsorption/desorption reactions. Anion exchange and adsorption usually occurs under lower pH conditions than those of cation exchange and adsorption. Contaminants found in aqueous solutions at the Laboratory probably occur both as anions ($UO_2(CO_3)_2^{2-}$, $H_2AsO_4^-$, $HAsO_4^{2-}$, Cl^-) and as cations (Ba^{2+}, $BeOH^+$, $^3H^+$ as HTO), based on speciation calculations using thermochemical data tabulated in Grenthe *et al.* (1992) and Rai and Zachara (1984).

Calcium Carbonate Content

Calcium carbonate content of the soils is highly variable, ranging from 0.1 wt% in a CBt horizon at Site 4, Twomile Mesa, to 100 wt% in a K horizon at Site 7, Ancho Canyon mesas (Watt and McFadden, 1992). Most of the calcium carbonate found in soils on the Pajarito Plateau probably originates from wind-blown or atmospheric sources (Watt and McFadden, 1992). Carbonate chemistry is important in controlling soil pH, providing active adsorption sites for anionic and cationic adsorbates, providing ligands for metal complexing—especially for uranyl [U(VI)], enhancing the stability of smectite characterized by a high cation exchange capacity (CEC), and controlling hydraulic conductivity. Carbonate-rich horizons likely reflect climatic conditions that favor relatively high amounts of atmospheric dust that is available for deposition. Calcium carbonate is an important adsorbent for cations (Cd^{2+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ba^{2+}) and anions (PO_4^{3-}, SeO_3^{2-}, and possibly $UO_2(CO_3)_2^{2-}$), where solution pH and calcium carbonate concentration are the most important factors controlling adsorption processes (Zachara *et al.*, 1993). Calcium carbonate content is discussed in more detail in specific soil profile sections below.

Cation Exchange Capacity

The CEC varies from 3 to 28.5 meq/100 g of soil, which is reflective of the different types of clay minerals present in the soils. Figure 14 is a bivariate plot of measured CEC values *vs* clay-size material, showing that CEC generally increases with increasing clay content. Because the B horizons have the highest clay mineral content, they also have the highest CEC. Higher CEC values are associated with 2:1 (octahedral:tetrahedral layers) clay minerals, such as smectite or mixed-layer smectite, whereas the lower CEC values are representative of 1:1 clay minerals, including kaolinite (Sposito, 1989; McBride, 1994). Clay minerals with higher CEC values are geochemically more reactive (as a result of larger surface area) than those with lower CEC values. Clay minerals and other adsorbents with larger surface areas have higher adsorption capacities than clay minerals with smaller surface areas (Sposito, 1989; McBride, 1994).

Attachment C

03-011

Memo to File

Date: September 5, 2002

To: SWMU 03-011 File

From: Robert Budd, RRES-R RB

RE: **ECOLOGICAL SCREENING EVALUATION FOR SWMU 03-011**

Attached is the ecological screening evaluation for Solid Waste Management Unit 03-011 conducted for the Los Alamos National Laboratory Risk Reduction and Environmental Stewardship Division's Remediation Group. This evaluation was completed in September 2002. This packet includes the following items:

- screening evaluation and discussion, and
- scoping checklist with conceptual model diagrams.

Ecological Screening Evaluation for SWMU 03-011

SWMU 03-011 is a concrete platform historically used for rinsing out empty chemical carboys. Archival information indicates that the carboys had originally contained volatile organic chemicals or acids. The rinsing station is located in the Laboratory's TA-03, near Building 03-31.

In July 2001, the ER Project collected four surface soil samples from four locations at SWMU 03-011 in order to determine the presence of any residual contamination at this SWMU and, if present, the extent of the contamination. The samples were submitted for fixed analytical analysis of pH and volatile organic chemicals (VOCs). The pH concentrations measured in the four soil samples at SWMU 03-011 ranged from 6.0 to 7.9, which is within the normal pH range (5.2 to 8.2) for the Laboratory (LANL 1996, 55115), thus indicating no acid contamination. Three VOCs (tetrachloroethene, 1,1,1-trichloroethane, and trichloroethene) were detected. Tetrachloroethene was detected in three of the four samples at concentrations of 0.004, 0.008, and 0.038 mg/kg. Trichloroethane [1,1,1-] was detected in one of the four samples at a concentration of 0.002 mg/kg. Trichloroethene was detected in three of the four samples at concentrations of 0.009, 0.014, and 0.021 mg/kg.

The purpose of the ecological screening evaluation is to identify chemicals of potential ecological concern (COPECs) and not to calculate risk. The evaluation involves the calculation of hazard quotients (HQs) and hazard indices (HIs) for all COPCs identified in the data review for all appropriate screening receptors as described in "Screening Level Ecological Risk Assessment Methods" (LANL 1999, 64783). The HQ analysis is based on the exposure concentration (i.e., maximum detected concentration, maximum detection limit, or 95% upper confidence limit of the arithmetic mean) for each COPC and is calculated by dividing these values by the soil ecological screening levels (ESLs) for the screening receptors (plant, earthworm, deer mouse, vagrant shrew, desert cottontail, American robin [herbivore, omnivore, insectivore], American kestrel [with and without an all meat diet], and fox). The ESLs were obtained from the ECORISK database, version 1.4 (LANL 2002, 72802.1). If the maximum HQ resulting from this comparison is greater than 0.3, a more detailed HI analysis is conducted for that chemical to determine if the potential for adverse ecological impacts exists and to determine the overall contribution of the chemical to the HI for each receptor. The chemicals resulting in a HQ greater than 1.0 or contributing more than 0.3 to an HI greater than 1.0 are identified as COPECs.

Table 1 presents a comparison of the maximum detected values for tetrachloroethene, 1,1,1-trichloroethane, and trichloroethene to the minimum terrestrial ESL for each analyte detected.

TABLE 1
MAXIMUM DETECTED SOIL CONCENTRATION AND ESLs FOR SWMU 03-011

Analyte	Maximum Value (mg/kg)	Minimum ESL (mg/kg)	Receptor	HQ
Tetrachloroethene	0.038	3.8	Deer mouse	0.01
1,1,1-Trichloroethane	0.002	2500	Deer mouse	0.0000008
Trichloroethene	0.021	1.9	Deer mouse	0.01

Because the maximum HQ for each of the three VOCs detected at SWMU 03-011 is less than 0.3, none of these contaminants are considered to be COPECs. Therefore, there is no potential risk to ecological receptors from the trace levels of residual contamination remaining at SWMU 03-011.

References

LANL (Los Alamos National Laboratory), March 2002. "LANL ECORISK Database, Version 1.4," Los Alamos National Laboratory CD ROM, LANL ER Records Package 186, Los Alamos, New Mexico. (LANL 2002, 72802.1)

References (cont.)

LANL (Los Alamos National Laboratory), December 1999. "Screening Level Ecological Risk Assessment Methods," Los Alamos National Laboratory report LA-UR-99-1405, Los Alamos, New Mexico. (LANL 1999, 64783)

LANL (Los Alamos National Laboratory), May 1996. "Natural Background Geochemistry, Geomorphology, and Pedogenesis of Selected Soil Profiles and Bandelier Tuff, Los Alamos, New Mexico," Los Alamos National Laboratory Manuscript LA-12913-MS, Los Alamos, New Mexico, pp. 25-26. (LANL 1996, 55115)

ECOLOGICAL SCOPING CHECKLIST

PART A—SCOPING MEETING DOCUMENTATION

Site ID	
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	This SWMU is comprised of a concrete pad that served as an area for washing empty chemical carboys containing organic chemicals or acids, and the area immediately surrounding it. A non-PCB electric transformer currently occupies the pad. Discharges were either onto the soil below the water spigot located directly to the north of the pad, or onto the pad itself, which would then flow off to the south into the drainage.
List of Primary Impacted Media (Indicate all that apply.)	Surface soil – Releases were surface discharges onto area surrounding concrete pad and under the water spigot at SWMU 03-011. Surface water/sediment – Subsurface – Groundwater – Other, explain –
FIMAD vegetation class based on Arcview vegetation coverage (Indicate all that apply.)	Water – Bare Ground/Unvegetated – Spruce/fir/aspen/mixed conifer – Ponderosa pine – The area directly to the south of this SWMU, in which the drainage flows, is dominated by ponderosa pine. Piñon juniper/juniper savannah Grassland/shrubland – Developed – The SWMU falls within a developed area of TA-03. The drainage area directly to the south of the concrete pad is heavily vegetated with grasses and weeds.
Is T&E Habitat Present? If applicable, list species known or suspected to use the site for breeding or foraging.	The SWMU is approximately 1,300 ft from potential Mexican spotted owl nesting habitat and is within an area in which the spotted owl is conservatively assumed to forage at a relatively medium frequency.
Provide list, of Neighboring/ Contiguous/ Up-gradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. (Use this information to evaluate the need to aggregate sites for screening.)	There are no SWMUs or AOCs in the immediate vicinity of 03-011. The closest SWMU is 03-010(a) approximately 500 ft to the northwest of 03-011. These SWMUs are not connected nor do they influence each other in any way.

Surface Water Erosion Potential Information Summarize information from SOP 2.01, including the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water run-on sources.	The Erosion Matrix score for the drainage at this SWMU is 38.6, with a runoff score of 24 and a run-on score of 11. This score reflects that this is a mesa top site with 75 – 100% ground cover, and a slope of less than 10%. The terminal point of any runoff is the Two Mile Canyon drainage.

Part B—Site Visit Documentation

Site ID	SWMU 03-011
Date of Site Visit	August 29, 2002
Site Visit Conducted by	Robert Budd and Linda Nonno

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) = high; the area within the drainage to the south of the concrete pad is highly vegetated with grasses, mostly little blue stem and Canadian rye. Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = high; SWMU is within an industrial area surrounded on all sides by roads and a parking lot.
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	The SWMU is located within an industrial area, with a small patch of ground that is heavily vegetated with grasses and weeds.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	This SWMU is located within an industrial area, surrounded on all sides by asphalt. The ponderosa pine stand to the south along the drainage is not conducive for nesting or foraging grounds for T & E species (mexican spotted owl, peregrine falcon, bald eagle) due to its proximity to the industrial area.
Are ecological receptors present at the site? (yes/no/uncertain) Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.	There are most likely terrestrial receptors present around the site. Within the drainage there is good vegetation cover which would provide good habitat for small mammals such as field mice. There was no evidence of burrowing within or near the site. Directly to the south of the drainage is an area dominated by ponderosa pine that slopes off to Two Mile Canyon. There is no aquatic habitat on the mesa top and therefore no aquatic receptors at this SWMU.

Contaminant Transport Information:

Surface water transport Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).	There is a low potential for surface water runoff from this SWMU and there is no visible signs of erosion. There was evidence of runoff discharging from the sight. The area slopes into a metal pipe that runs under Mercury Road into an asphalt lined drainage. However, there is a very small slope (<10%), with a high vegetation cover (>75%) within the SWMU that would effectively reduce surface water runoff from the SWMU.
Are there any off-site transport pathways (surface water, air, or groundwater)? (yes/no/uncertain) Provide explanation	Surface water runoff would appear to be the primary off-site transport pathway, but no evidence of erosion is present. Transport via surface runoff is significantly reduced due to shallow slope and heavy vegetation, but the lined drainage downstream would increase probability of contaminants reaching the top of the canyon.
Interim action needed to limit off-site transport? (yes/no/uncertain) Provide explanation/ recommendation to project	No. Due to the very low concentrations of COPCs and low potential for runoff, any interim action to prevent off-site transport is unnecessary.

lead for IA SMDP.	

Ecological Effects Information:

Physical Disturbance (Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)	The SWMU is within an industrial area, with a road and parking lot surrounding the SWMU. Both are actively used by the laboratory. There is no apparent physical disturbance or erosion within the drainage area within the SWMU.
Are there obvious ecological effects? (yes/no/uncertain) Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).	No. There are no obvious ecological effects due to this SWMU.
Interim action needed to limit apparent ecological effects? (yes/no/uncertain) Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.	No. No apparent ecological effects are noted for this SWMU.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? (yes/no/uncertain) Provide explanation (Consider if the maximum value was captured by existing sample data.)	Yes. Soil samples were collected at the surface and analyzed for VOCs. The data shows a decrease in concentration laterally away from the area surrounding the concrete pad, with the samples collected farthest (~54 ft) from the pad nondetected values.
Do existing or proposed data for the site address potential transport pathways of site contamination? (yes/no/uncertain) Provide explanation (Consider if other sites should aggregated to characterize potential ecological risk.)	Yes. The primary off-site pathway would have been surface water runoff. The samples were collected from the area where runoff would have flowed and shows a decrease in concentrations laterally as the distance from the concrete pad increases.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: Three VOCS (tetrachloroethene, 1,1,1,-trichloroethane, and trichloroethene) were detected at very low concentrations (0.038, 0.002, and 0.021 mg/kg, respectively) at the end of the corrugated metal pipe under the concrete pad, but nothing was detected at the edge of the SWMU.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

Soil contamination would have to be on the actual surface of the soil to become available for dust.

In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: The release from the SWMU was to the surface soil. However, the VOCs would most likely volatilize at the surface and not bind to soil. Transport of contaminants via dust would also be significantly reduced by the high vegetation cover in the drainage.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

If the SOP 2.01 run-off score* for each SWMU included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* Note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).

If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: No erosion was evident. There are also no aquatic communities present in or around the SWMU.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

Known or suspected presence of contaminants in groundwater.

The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.

Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).

Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: There are no seeps or springs on the mesa top within SWMU 03-011. The regional aquifer is approximately 875 to 1100 ft below the ground surface and unavailable to receptors at 03-011.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

Suspected ability of contaminants to migrate to groundwater.

The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.

Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).

Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: The volatile nature of the VOCs at this site would have caused them to volatilize into the surrounding atmosphere during the 20 plus years since this SWMU ceased operation. Currently the COPCs are present at trace levels, therefore vertical transport to the regional aquifer is unlikely.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

This question is only applicable to release sites located on or near the mesa edge.

Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely.

Provide explanation: SWMU 03-011 is not on the mesa edge so mass wasting is not relevant. In addition, there is no evidence of erosion from this SWMU.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

Contaminants must be present as volatiles in the air.

Consider the importance of inhalation of vapors for burrowing animals.

Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: The VOCs detected were present at trace levels in the surface soil, therefore exposure to vapors would be insignificant.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.

Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Releases were to the surface soil and may be available to plants from deposition of particulates or to animals via fugitive dust from the site. There is not any noticeable burrowing activity within the SWMU.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

Contaminants in bulk soil may partition into soil solution, making them available to roots.

Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Provide explanation: Releases were to the surface soil and may be available to plants via root uptake or rain splash. However, all three COPCs are halogenated aliphatic compounds (HACs) which have low to moderate solubilities and high volatilities which would limit mixing with water and increase chance of vaporizing.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

The chemicals may bioaccumulate in animals.

Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: VOCs are not bioaccumulating compounds.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Releases were to the surface soil and may be available through incidental ingestion.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: Although the VOCs in question have a moderate Kow coefficient, it is unlikely that they would pass across the dermal layer at these soil concentrations.

Question M:

Could contaminants interact with plants or animals through external irradiation?

External irradiation effects are most relevant for gamma emitting radionuclides.

Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: Radionuclides were not COPCs at this SWMU.

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.

Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.

Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: Releases were to the surface soil and may be available to plants via root uptake or rain splash. However, all three COPCs are halogenated aliphatic compounds (HACs) which have low to moderate solubilities and high volatilities which would limit mixing with water and increase chance of vaporizing.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

The chemicals may bioconcentrate in food items.

Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There is little surface water runoff from this SWMU into the canyon.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.

Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There is little surface water runoff from this SWMU into the canyon.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.

Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There is little surface water runoff from this SWMU into the canyon.

Question R:

Could contaminants interact with plants or animals through external irradiation?

External irradiation effects are most relevant for gamma emitting radionuclides.

Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: Radionuclides were not COPCs at this SWMU.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

Aquatic plants are in direct contact with water.

Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: No aquatic communities are present in or around this SWMU.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

Aquatic receptors may actively or incidentally ingest sediment while foraging.

Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.

Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic communities are present in or around this SWMU.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

Lipophillic organic contaminants and some metals may concentrate in an organism's tissues

Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic communities are present in or around this SWMU.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

External irradiation effects are most relevant for gamma emitting radionuclides.

The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

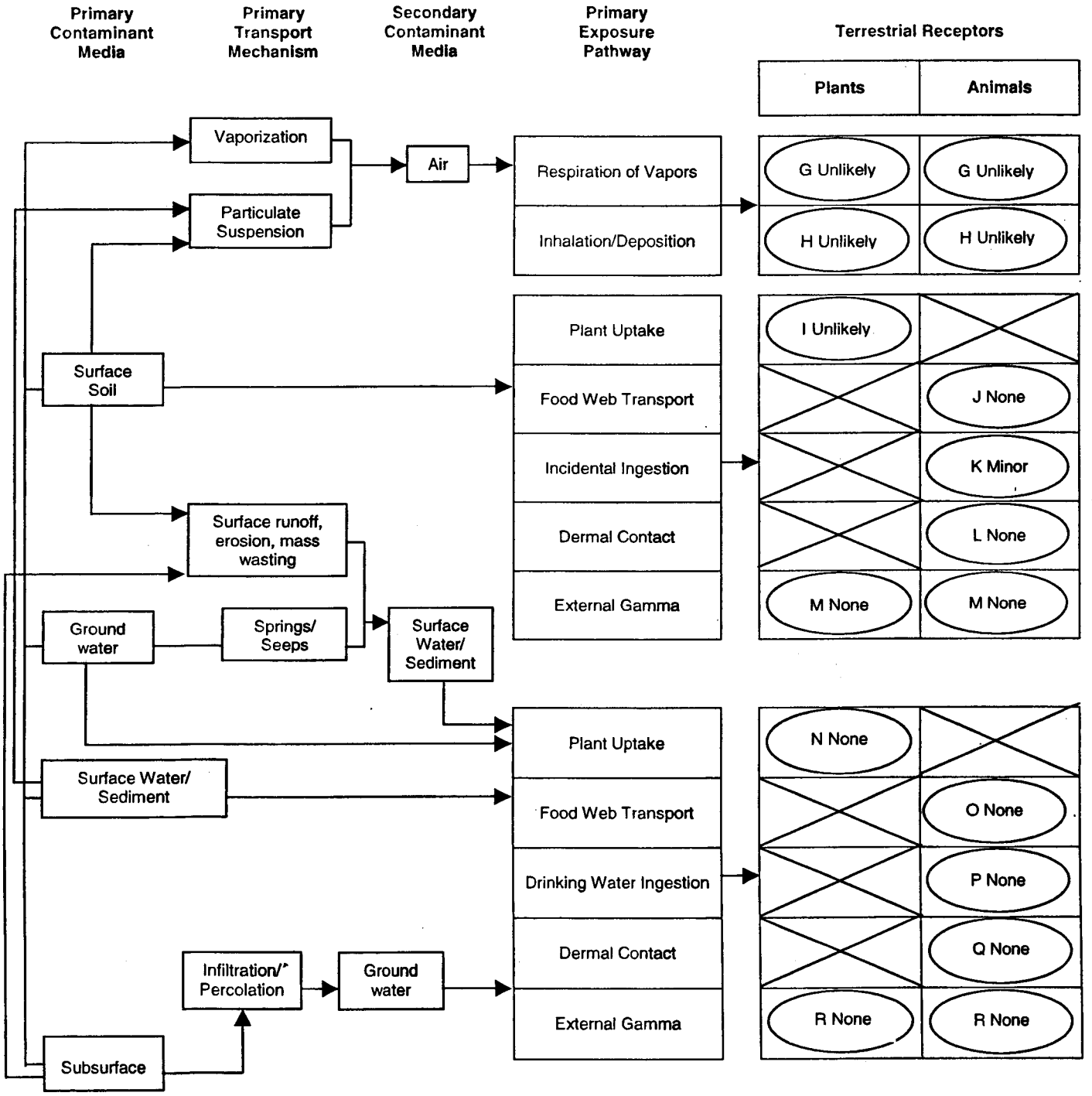
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: Radionuclides were not COPCs at this SWMU.

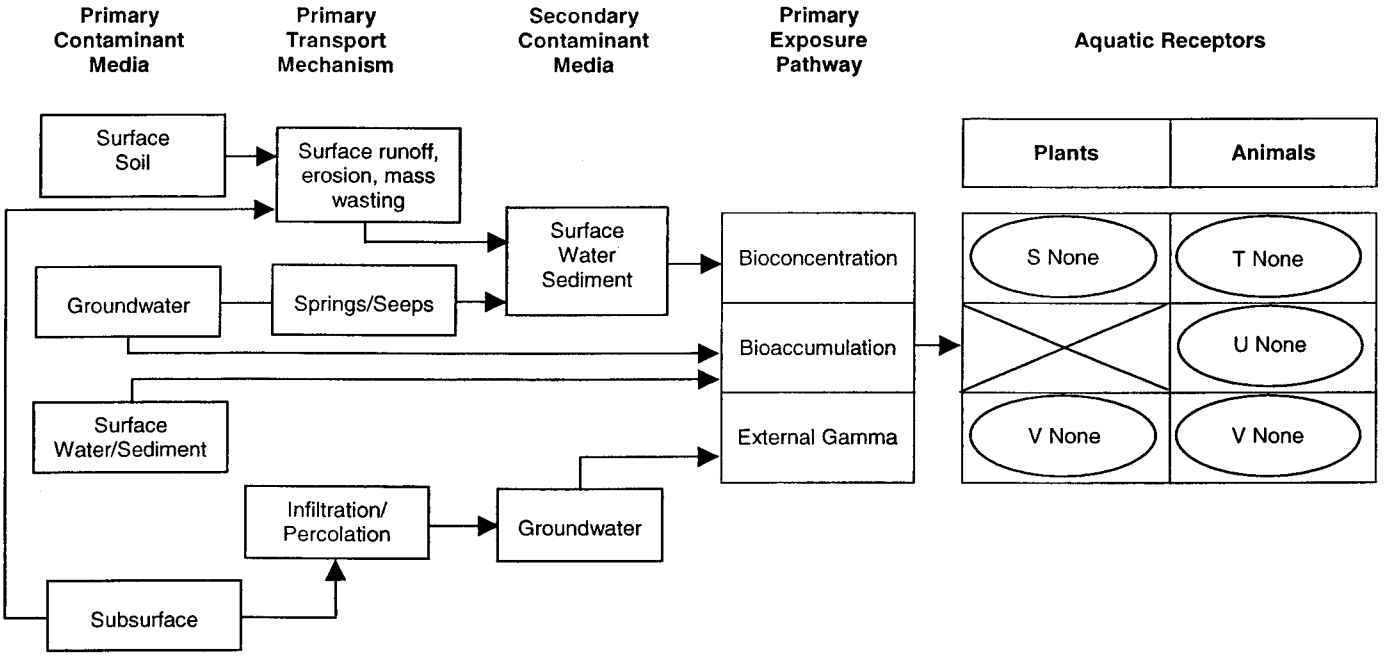
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model



Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed):	Robert Budd
Name (signature):	Robert Budd
Organization:	RRES-R
Phone number:	(505)667-5905
Date Completed:	September 5, 2002

Verification by a member of ER Project Ecological Risk Task Team (provide name, organization and phone number):

Name (printed):	Richard Mirenda, Ph.D.
Name (signature):	Richard Mirenda
Organization:	RRES-R
Phone number:	(505) 665-6953

Los Alamos National Laboratory

Environment, Safety & Health Division
ESH-18 Water Quality & Hydrology Group

Surface Water Assessment
Erosion Matrix for PRS 03-011

CRITERIA EVALUATED	Value	Erosion/Sediment Transport Potential Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43)					
On mesa top	1	Defined based on topographic setting			1.0
Within bench of canyon	4				
Within the canyon floodplain but not watercourse	13				
Within bottom of canyon channel in watercourse	17				
Estimated % ground and canopy cover	13	>75%	25-75%	<25%	1.3
Slope	13	0-10%	10-30%	>30%	1.3
Surface Water Factors-Run-off (46)					
Visible evidence of runoff discharging? (Yes/No)	5	If no, score of 0 for runoff section.			5.0
		If yes, score 5 and proceed with section.			
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	19.0
Has runoff caused visible erosion? (Yes/No)	22	Sheet	Rill	Gully	0.0
		If no, score as 0. If yes, calculate as appropriate.			
Surface Water Factors-Run-on (11)					
Structures adversely affecting run-on (Yes/No)	7*	If yes, score as 7. If no, score as 0.			7.0
Current operations adversely impacting (Yes/No)	4	If yes, score as 4. If no, score as 0.			4.0
Natural drainages onto site (Yes/No)	7*	If yes, score as 7. If no, score as 0.			*
**Select either structures or natural drainages.*					
MAX. POSSIBLE EROSION MATRIX SCORE:	**100**			**Total Score**	38.6

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Attachment D

03-011

Los Alamos National Laboratory
SURFACE WATER
SITE ASSESSMENT

SITE INFORMATION

1a) PRS Number 03-011 **1b) Structure Number** **1c) FMU Number** 80

2. Date/Time (M/D/Y H:M am/pm) 7/29/1997 10:35:00 AM

SITE SETTING (check all that apply)

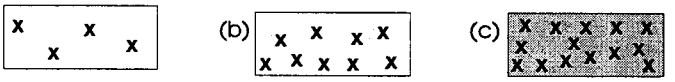
3. ◉ **On mesa top (a).** ○ **In the canyon floor, but not in an established channel (c)**

○ **Within a bench of a canyon (b).** ○ **Within established channel in the canyon floor (d).**

Explanation: SW of SM-31

4. Estimated ground and/or canopy cover at site: (deciduous leaves, pine needles, rocks, vegetation, trees,

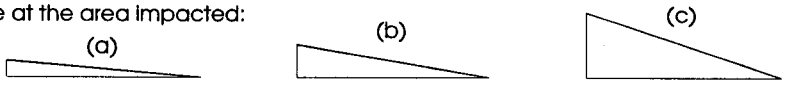
(illustration)



Estimated % of ground/canopy cov ○ 0% to 25% ○ 25% to 75% ◉ 75% to 100%

Explanation:

5. Steepest slope at the area impacted:



◉ Less than 10% ○ 10% to 30% ○ 30% and greater

Explanation:

RUNOFF FACTORS

Y / N

☑ ☐ **6. Is there visible evidence of runoff discharging from site? If yes, answer a) - c) below:**

☑ ☐ 6a) Is runoff channelized? If yes, describ ◉ Man-made channel. ○ Natural channel.

Explanation:

RUNOFF FACTORS, CONT'D

6b) Where does evidence of runoff terminate?

- (●) **Drainage or wetland (name)** Two Mile Canyon
- ( ) **Within bench of canyon setting (name)**
- ( ) **Other (i.e., retention pond, meadow, mesa top)**

Explanation:

Y / N

☐ ☑ 6c) Has runoff caused visible erosion at the site? If yes, explain below: ( ) Sheet ( ) Rill ( ) Gully

Explanation:

RUN-ON FACTORS

Please rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)

☑ ☐ **7.** Are structures (i.e., buildings, roof drains, parking lots, storm drains) creating run-on to the site?

Explanation:

☑ ☐ **8.** Are current operations (i.e., fire hydrants, NPDES outfalls) adversely impacting run-on to the site?

Explanation:

☑ ☐ **9.** Are natural drainage patterns directing stormwater onto site?

Explanation: Parking lot 3/4 around site feeds drainage channel.

ASSESSMENT FINDING:

☐ ☑ **10. Based on the above criteria and the assessment of this site, does soil erosion potential exist? (REFER TO EROSION POTENTIAL MATRIX.)**

R. Reynolds

11. Signature of Water Quality/Hydrology Representative

_____ Initials of independent reviewer.

Check here when information is entered in database: ☑

This page is for ESH-18 notes, recommendations, and photos.

	Y	N	
12. a)	◉	○	Is there visible trash/debris on the site?
b)	○	◉	Is there visible trash/debris in a watercourse?

Description of existing BMPs:

○	○	Are BMPs being properly maintained? If no, describe in "Other Internal Notes."
○	○	Are BMPs effectively keeping sediment in place and reducing erosion potential?

OTHER INTERNAL NOTES:

3.0 SWMU 03-046—ACTIVE ABOVEGROUND WASTEWATER TANK

3.1 Summary

SWMU 03-046 is an active aboveground wastewater neutralization tank located in TA-03 near the Laboratory's steam plant. The function of the tank is to collect wastewater from boilers, softeners, and a demineralization tank located at the steam plant and to ensure that the effluents from this equipment meet National Pollutant Discharge Elimination System (NPDES) permit discharge requirements by adjusting pH, as needed. The contents of the tank are directly discharged to an NPDES-permitted outfall. Because the tank is a component in this system, it is also subject to NPDES requirements as regulated by EPA under the Clean Water Act. No documented releases from the tank have occurred. The 12-ft-deep concrete secondary containment surrounding the tank would prevent any potential future release from reaching the environment. SWMU 03-046 is being proposed for NFA under NFA Criterion 4 (the site is regulated in accordance with another state and/or federal authority and is not known or suspected of releasing RCRA solid or hazardous wastes and/or constituents to the environment).

3.2 Description and Operational History

3.2.1 Site Description

SWMU 03-046 is an active aboveground wastewater neutralization tank located in TA-03 approximately 60 ft southeast of Building 03-22, the Laboratory's steam plant (Figure 3.2-1). The tank is fiberglass and has a capacity of 10,000 gal. It is completely enclosed in a 14.6- x 14.6- x 12-ft-deep concrete secondary containment area with a concrete floor and walls that are approximately 1 ft thick. A photograph of the neutralization tank and its containment is included as Attachment A (LANL 1993, 68058).

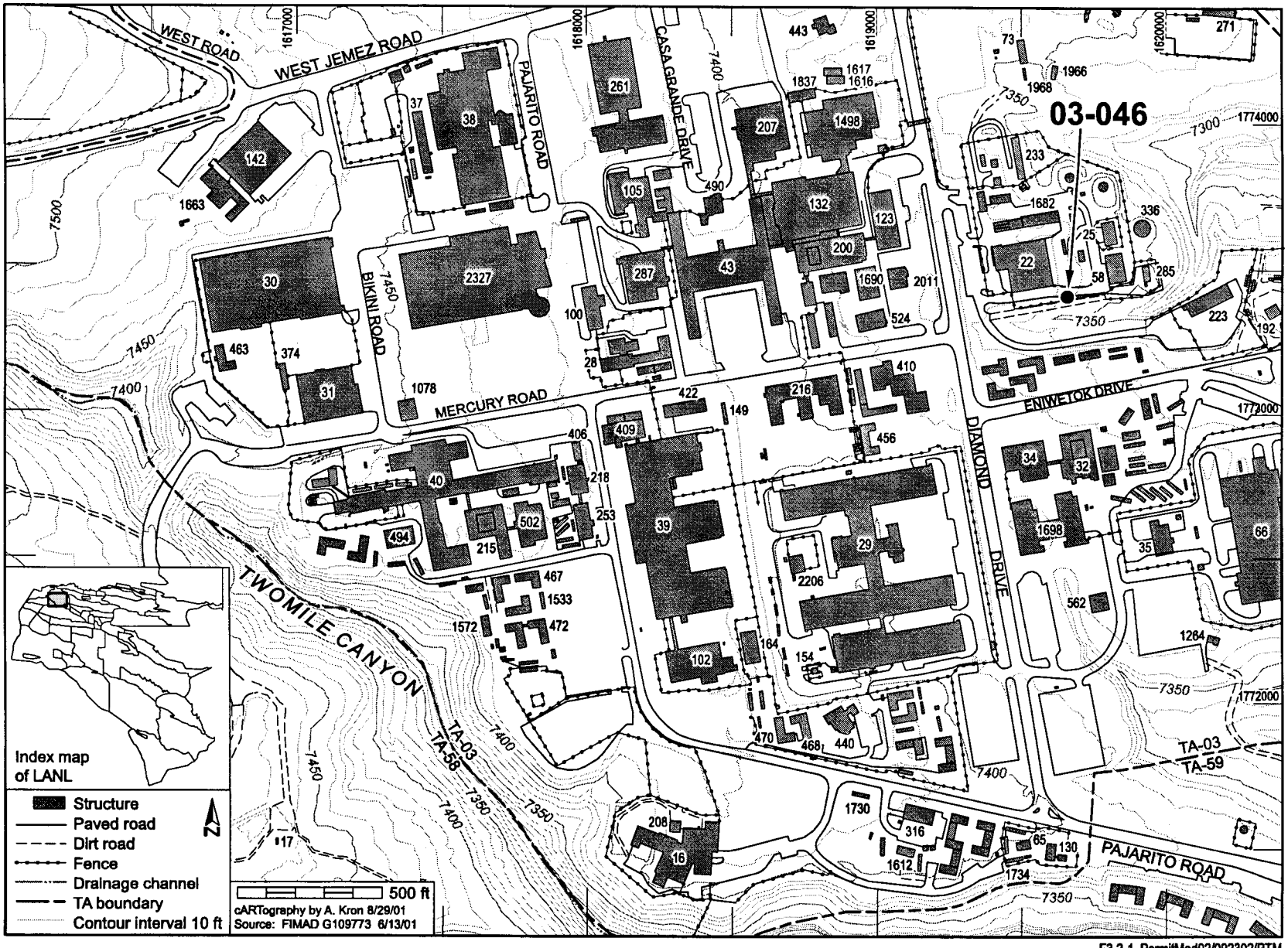
There is an access space between the tank and the walls of the containment area surrounding the tank to allow for visual inspection of the tank. Visual inspections for integrity are conducted daily by steam plant operations and maintenance personnel and quarterly by personnel from the Laboratory's Water Quality and Hydrology Group as mandated under the Storm Water Pollution Prevention Plan for Building 03-22 (Zimmerly 1999, 69790) (Attachment B).

The closest AOC/SWMU to SWMU 03-046 is SWMU 03-045(b), the NPDES outfall to which the SWMU 03-046 neutralization tank discharges. The SWMU 03-045(b) NPDES outfall is located approximately 100 ft southeast of SWMU 03-046 and is part of Consolidated Unit 03-012(b)-00.

3.2.2 Operational History

The sole function of the SWMU 03-046 tank is to collect the wastewater from boilers, softeners, and a demineralization tank located at the Building 03-22 steam plant and to ensure that the effluents from this equipment meet NPDES-permit discharge requirements by adjusting pH, as needed. The pH adjustment is made using either sulfuric acid or sodium hydroxide. When the wastewater in the tank is adjusted to the proper pH, it is released to a drain that subsequently receives discharges from two cooling towers and a chlorine building (Santa Fe Engineering 1994, 70001) (Attachment C). The drain discharges to Sandia Canyon through an NPDES-permitted outfall, 01A001, subject to the NPDES discharge requirements of Subsection 1342 of the Clean Water Act (US Code: Title 33, Chapter 26, Subchapter IV, Subsection 1342). The outfall is designated as a separate SWMU [03-045(b)] and is included as part of Consolidated Unit 03-012(b)-00.

Archival search resulted in no record of a release from the SWMU 03-046 tank itself.



F3.2-1_PermitMod02/092302/PTM

Figure 3.2-1. Location of SWMU 03-046

3.3 Land Use

3.3.1 Current

TA-03 is an industrial area containing the core of the Laboratory's operational facilities, including its principal administrative buildings, cafeteria, library, workshops, and warehouses. The SWMU 03-046 wastewater treatment tank is located approximately 60 ft southeast of Building 03-22, the Laboratory's steam plant. The tank's location is in an industrial area with high-security restricted access. A chain-link fence topped with barbed wire encloses the portion of the technical area where this SWMU is located. Access through the fence is obtained only by passing through a guard gate. These security measures effectively eliminate the possibility of inadvertent site intrusion.

3.3.2 Future/Proposed

The Laboratory does not anticipate any change from industrial use with restricted access of this portion of TA-03 for the operational life of the Laboratory (LANL 1995, 57224, pp. 11–12) (Appendix B, Attachment 1).

3.4 No Further Action Proposal

3.4.1 Rationale

The SWMU 03-046 tank is a component of an NPDES system. As such, the tank and its contents are regulated by EPA under the requirements of Subsection 1342 of the Clean Water Act. The components of this NPDES system (including the tank) are inspected quarterly and maintained by personnel from the Laboratory's Water Quality and Hydrology Group.

The Laboratory's RRES-R Program is proposing SWMU 03-046 for NFA under Criterion 4 based on the following:

- The sole purpose of the tank is to collect wastewater from Building 03-22 steam plant equipment (water boilers, softeners, and a demineralization tank) and to ensure that these effluents meet NPDES-permit discharge requirements by adjusting pH, as needed.
- The contents of the tank are discharged to an outfall that is subject to NPDES permit requirements, pursuant to Subsection 1342 of the Clean Water Act (US Code: Title 33, Chapter 26, Subchapter IV).
- No releases have occurred from the tank. The 12-ft-deep, 1-ft-thick concrete secondary containment surrounding the tank would effectively prevent any potential future release from reaching the environment.
- NPDES systems and any potential future releases from them are regulated by EPA under the statutory authority of the Clean Water Act.

3.4.2 Criterion

Based on the information presented in Sections 3.2 through 3.4, SWMU 03-046 is being proposed for NFA under Criterion 4.

3.5 Supporting Documentation Attached

Attachment A: Photograph of SWMU 03-046 neutralization tank. (LANL 1993, 68058)

Attachment B: Relevant pages from Storm Water Pollution Prevention Plan for TA-3-22. (Zimmerly 1999, 69790)

Attachment C: Relevant pages from Wastewater Stream Characterization Study for TA-3-22. (Santa Fe Engineering 1994, 70001)

Appendix B, Attachment 1: LANL site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

3.6 Reference Used for Text of the Proposal for Permit Modification for SWMU 03-046

LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory report LA-UR-95-731, Los Alamos, New Mexico, pp. 6-61 to 6-63. (LANL 1995, 57590)

NMED (New Mexico Environment Department), March 1998. "RPMP Document Requirement Guide," Hazardous and Radioactive Materials Bureau, RCRA Permits Management Program, Santa Fe, New Mexico. (NMED 1998, 57897)

3.7 History of Regulatory Deliverables

LANL, July 1995:	RFI work plan for OU 1114, Addendum 1 submitted to EPA. (LANL 1995, 57590)
EPA, November 1, 1995:	NOD for OU 1114 RFI work plan, Addendum 1. (EPA 1995, 55161.49)
LANL, February 8, 1996:	Response to NOD for OU 1114 RFI work plan, Addendum 1. (LANL 1996, 54088)
NMED, August 26, 1996:	Disapprovals of OU 1114 RFI work plan [Addendum 1] and LANL response to NOD. (NMED 1996, 65591)
LANL, November 6, 1996:	Request for clarification of disapproval letter for NOD response for RFI work plan for OU 1114, Addendum 1. (LANL 1996, 55188)

3.7.1 References for Regulatory Deliverables

LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1114, Addendum 1," Los Alamos National Laboratory report LA-UR-95-731, Los Alamos, New Mexico, pp. 6-61 to 6-63 (LANL 1995, 57590).

EPA (US Environmental Protection Agency), November 1, 1995. "Notice of Deficiency, Addendum 1 to Work Plan for Operable Unit (OU) 1114, Los Alamos National Laboratory (NM0890010515)," US Environmental Protection Agency (Region 6) letter to T. Taylor (DOE Program Manager) from D. W. Neleigh (EPA Region 6 Chief, New Mexico Federal Facilities Section), Dallas, Texas. (EPA 1995, 55161.49)

LANL (Los Alamos National Laboratory), February 8, 1996. "Response to the Notice of Deficiency for the RFI Work Plan for Operable Unit 1114, Addendum 1," Field Unit 1, Los Alamos National Laboratory report, Los Alamos, New Mexico. (LANL 1996, 54088)

NMED (New Mexico Environment Department), August 26, 1996. "Disapproval of the RCRA Facility Investigation Work Plan for Operable Unit 1114, Los Alamos National Laboratory (NM0890010515)," NMED letter to G.T. Todd (DOE-LAAO) from E. Kelley (NMED-HRMB), Santa Fe, New Mexico. (NMED 1996, 65591)

LANL (Los Alamos National Laboratory), November 6, 1996. "Clarification Request for the EPA Disapproval Letter for OU 1114 RFI Work Plan, Addendum 1, NOD Response," Los Alamos National Laboratory letter EM/ER:96-573 to E. Kelley (NMED-HRMB) from J. Jansen (LANL ER Program) and T. Taylor (DOE-LAAO), Los Alamos, New Mexico. (LANL 1996, 55188)

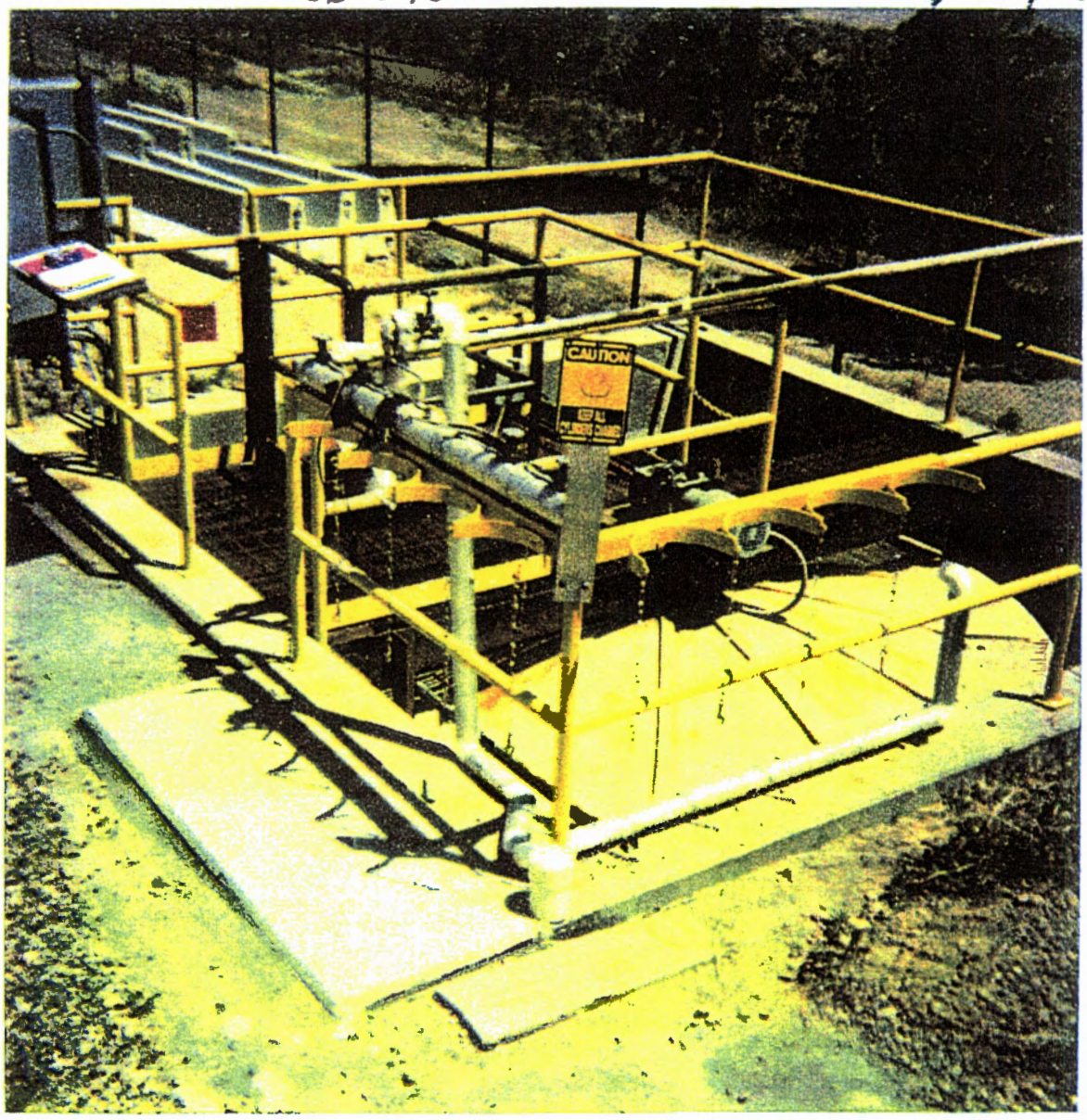
03-046

ATTACHMENTS

Attachment A

03-046

5/13/93



V=S ENV. TANK – (NO STRUCTURE #)
FIBERGLASS
SWMU 3-046
Assoc. Structure TA-3-22

Attachment B

03-046

MULTI-SECTOR STORM WATER POLLUTION PREVENTION PLAN FOR TECHNICAL AREA 3 BUILDING 22 POWER PLANT (TA-3, SM-22)

October 18, 1999

MULTI-SECTOR
STORM WATER POLLUTION PREVENTION PLAN
FOR TECHNICAL AREA 3 BUILDING 22
POWER PLANT (TA-3, SM-22)

October 18, 1999

Prepared by: _____ Date 10-26-99
Tim Zimmerly, HENV

Reviewed by: _____ Date 10-26-99
Suzanne Moore, HENV

Table 3.1 Summary of Exposed Materials and Potential Sources		
Significant Activities and Materials Exposed (see site map, Appendix B)	Capacity (gallons)	Containment Information
Environmental Tank (Drainage Area E)	10,000	Material: Holds Process water from plant, possible acid/caustic pH conditions, electronic pH metering equipment provided. Containment: Primary containment is fiberglass tank, designed for low pH materials (acid). Primary containment is concrete structure >10,000 gallons. No discharge valve for containment.
Chemical Storage Tanks (Drainage Area F)	2 @ 4500	Material: Previously stored Fungicide and Algaecide for cooling tower maintenance. Comments: Tanks are not in use and there are no plans to use them. Containment: Steel tanks: BETZ 562C tank and BETZ 2020 tank. Secondary containment for each tank is concrete curb. Containment discharges through locked valves.
Oil Bearing Transformers and Switch gear Area Transformers TA-3-230 (Drainage Area A) Transformers TA-3-233 (Drainage Area B) Capacitor Bank TA-3-1188 (Drainage Area B)	Minimal	Material: Non-PCB oil. Containment: Curb around TA-3-230 and 233, gravel and level grades.
Loading /Unloading Area (Dechlorination Building #24) (Drainage Area F)	NA	Material: Sodium Bisulfite, Garratt-Callahan Formula #159 in 55 gallon drums. Formula #2010 transferred by hoses Containment: Secondary containment is provided in building for chemical containers. Spill prevention controls used during transfer operations.

Spill prevention practices at TA-3 SM-22 include good housekeeping, the use of secondary containment for chemicals and fuels, proper handling and storage of material in drums and other containers, drip pans under dispensing valves and connections, the placement and use of spill kits at selected locations, and others. Spill kits are available in TA-3 SM-22, and additional absorbent material is available at the outside drum storage area and the loading zones. Spill prevention techniques used during loading and unloading operations were described in Section 4.3 above. If any additional plans or requirements are forthcoming which will affect response to spills of materials at the Power Plant, this plan will be modified to reflect the new plans or requirements.

In general, the approach to spill clean-up is to first contain the spill by securing the spill source and deploying spill containment materials. In many cases, the secondary containment structures will contain the spill. Small spills are responded to by the operator involved in the spill or in the vicinity. For incidental releases, absorbents are used to pick-up free liquids and the contaminated absorbents are properly disposed. Standard procedures for spill containment and clean up include the use of spill control kits, sorbent pillows, socks, sheets, and granules. Clean-up residues are managed as hazardous waste, as appropriate, and as determined by the facility waste coordinator and spill coordinator. Larger spills require that a spill coordinator be contacted to respond to the spill, securing the spill area and contacting the Laboratory's EM&R Team.

4.5 Inspections

Visual inspections implemented at this facility include the monthly and annual inspection by the Pollution Prevention Team and the daily walk-arounds conducted by the operations and maintenance staff as part of the routine operations. The walk-arounds by the Power Plant operations personnel include noting spill issues, potential storm water pollution sources, and looking for evidence of erosion or clogged stormwater conveyances. In addition, operations personnel note the conditions and level of water contained in containment basins and earthen berms. Potential problems that are noted are brought to the attention of the spill coordinator or the Plant Engineer for further action.

The annual evaluation includes a visual inspection of storm water dikes, catchment basins, and conveyances, as well as the material storage areas and loading dock areas. See Section 5.0 for additional information.

Monthly inspections are conducted in the following areas: loading/unloading areas, switchyards, fueling areas, maintenance areas, liquid storage tanks, and long term and short term material storage areas.

4.6 Employee Training, Record Keeping and Internal Reporting

Employees who handle hazardous materials are required to have training on the hazards of the materials with which they are working. Additionally, material safety data sheets (MSDSs) are available for the chemicals in use at the facility. Employees who handle waste chemicals also must have training in the Laboratory's procedures for waste generation and disposal. In addition,

APPENDIX A

POLLUTION PREVENTION TEAM WORKSHEET

TA-3 SM-22 Power Plant Storm Water Pollution Prevention Team Roster

SWPP Team Leader	Gary Blauert, Manager, Electric and Steam Systems
Inspectors	Paul Parker, PE, Plant Engineer Supervisor Bobby Montano, Cogeneration Supervisor Joe Ortiz, Spill Coordinator Mike Alexander, ESH-18 Water Quality Program Tim Zimmerly, HENV

Attachment C

03-046

WASTEWATER STREAM CHARACTERIZATION FOR CATEGORIES 01A (TA 3-22, 3-24, 3-25 & 3-58) AND 02A (TA 16-540 & TA 21-357) PLUS BUILDINGS TA 3-23, 3-26, 3-27, 3-55, 3-57, 3-144, 3-230, 3-231, 3-232, 3-233, 3-251, 3-336, 3-1188, 3-1535, 3-1651, 3-1790, 3-2042, 16-457 & 16-542

at
Los Alamos National Laboratory

ENVIRONMENTAL STUDY

CHARACTERIZATION REPORT # 1

ENVIRONMENTAL MANAGEMENT DIVISION
Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Los Alamos National Laboratory is operated by the University of California for the United States Department of Energy

3.0 RECOMMENDATIONS FOR TA-3 POWER PLANT

Tables 1, 2, 3, 4, 5, 6 and 7 are lists of the drains to the outfalls for the buildings in the TA-3 Power Plant Area and Figures 2, 3, 4, 5, 6, 7, 8 and 9 are schematics of the piping. The table lists the drains that connect to each outfall pipe and includes recommendations for changes to the drain piping. The discussion below gives the reasoning for the recommendations.

3.1 Outfall 3-22-OPN-1

This outfall receives flow from a boiler feed water filter system. The water flows to the sanitary sewer system that is connected to the TA-3 sanitary treatment plant that discharges as 01S. The flow from this outfall will be high in Total Suspended Solids (TSS) from the diatomaceous earth used in the filters. This outfall should be repiped to the environmental tank so that it will be discharged through the 01A001 outfall to eliminate the solids loading to the TA-3 sanitary treatment plant. This outfall will be part of the 01A001 outfall. A revised EPA Form 2C was prepared for outfall 01A001.

3.2 Outfall 3-22-OPN-2

This outfall receives blow down from the boilers and is pumped to the environmental tank. No changes are recommended for this outfall. This outfall is included in the EPA Form 2C for 01A001.

3.3 Outfall 3-22-OPN-3

This outfall receives flow from floor drains in the basement, on the first floor, on the mezzanine, on the heater floor and on the platform and discharges to the arroyo. Any oil that might be spilled will be caught in the pump suction sump. This sump should be regularly checked for oil. Better lighting would be helpful to find any oil floating in the sump. Secondary

containment is needed around the batteries near floor drain MFD1 to eliminate the possibility of low pH water being discharged. This outfall is permitted as 04A151. The types of water received are steam condensate and floor washings. The flow of steam condensate is the major flow. During the site visit, steam condensate was the only flow. Repiping of this outfall to the environmental tank is recommended as the flow is primarily condensate, not cooling water as indicated by the category 04A. All needed repiping could be done inside the building. A revised EPA Form 2C was prepared for outfall 04A151

3.4 Outfall 3-22-OPN-4

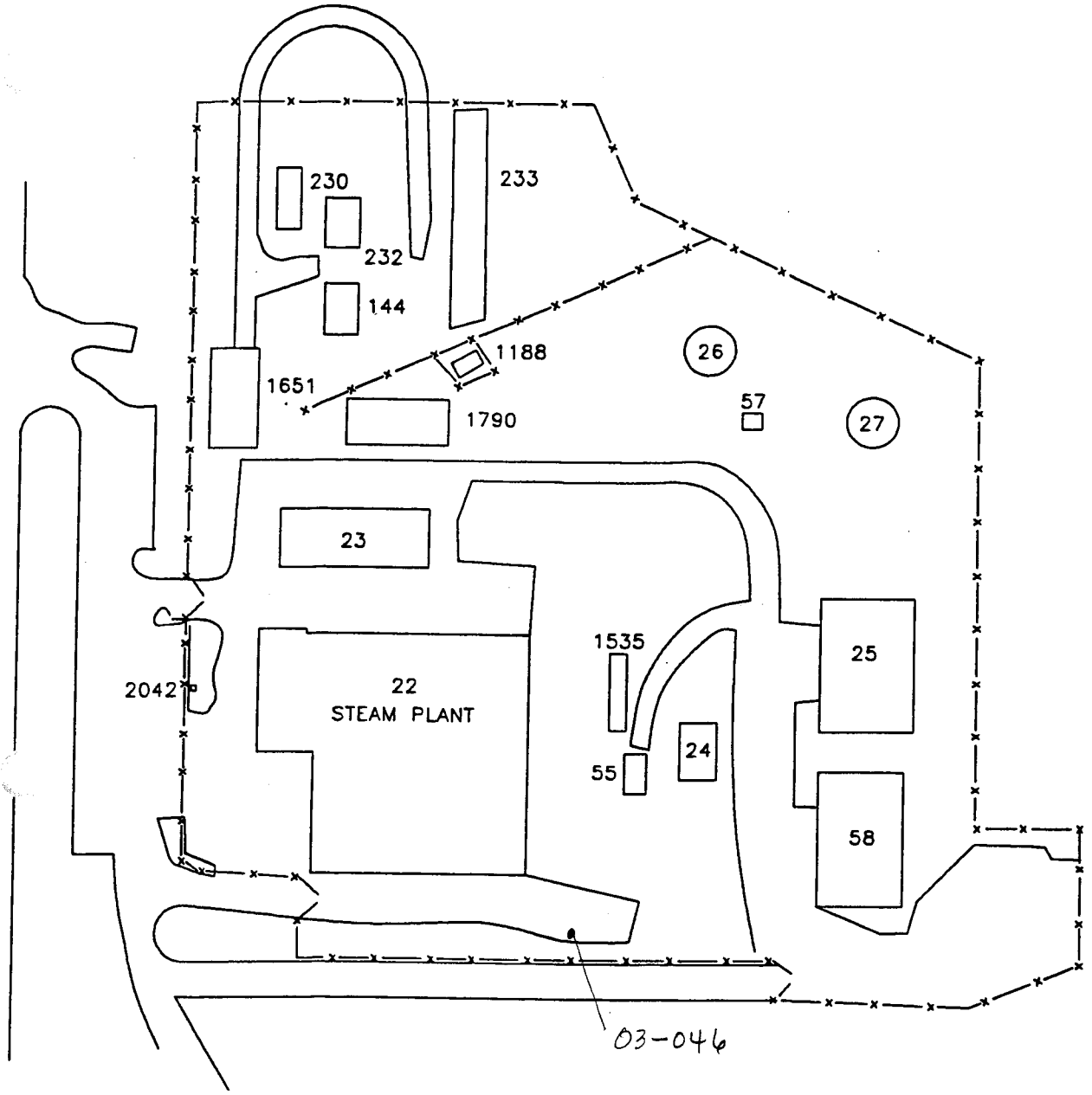
This outfall receives water from the chemical treating area and flows to the environmental tank. No changes are recommended. This outfall is included in the EPA Form 2C prepared for outfall 01A001.

3.5 Outfall 3-22-OPN-5

This outfall can receive water from the environmental tank, two cooling towers and the chlorine building and flows to the arroyo. This outfall is permitted as 01A001. An EPA Form 2C is attached for this outfall.

3.6 Outfall 3-22-OPN-6

This outfall receives flow from the sanitary facilities in the building. All flows are appropriate for the sanitary sewer system. The flow goes to the TA-3 treatment plant which discharges as 01S. It is recommended that the sink in the Test Lab be labeled "NO CHEMICAL DISPOSAL". No permitting is recommended. No EPA forms were prepared.



SANTA FE ENGINEERING, LTD.		
TA-3 POWER PLANT BUILDING COMPLEX	DRAWN	MSC
	DESIGN	MSC
	CHECKED	PEB
	DATE	6/17/92
SUBMITTED	RECOMMENDED	APPROVED
Los Alamos — Los Alamos National Laboratory, Los Alamos, New Mexico 87545	SHEET	OF
CLASSIFICATION	REVIEWER	DATE
REQUESTING DIVISION / REQUESTING GROUP EM-8	LAB JOB NO. 11056-1	DRAWING NO. FIGURE 1 / REV.

4.0 SWMU 16-026(f)—TWO OUTFALLS AND ASSOCIATED DRAINLINES

4.1 Summary

SWMU 16-026(f) consists of two outfalls (and associated drainlines) located at Building 16-308, a high-explosives (HE) processing building at TA-16. The 1990 SWMU report states that the drains associated with this building received HE and barium. However, archival documentation and site visits demonstrate that neither outfall has ever managed solid or hazardous wastes or constituents either currently or in the past. Therefore, this SWMU is being proposed for NFA under NFA Criterion 2 (the site has never been used for the management of RCRA solid or hazardous wastes and/or constituents).

4.2 Description and Operational History

4.2.1 Site Description

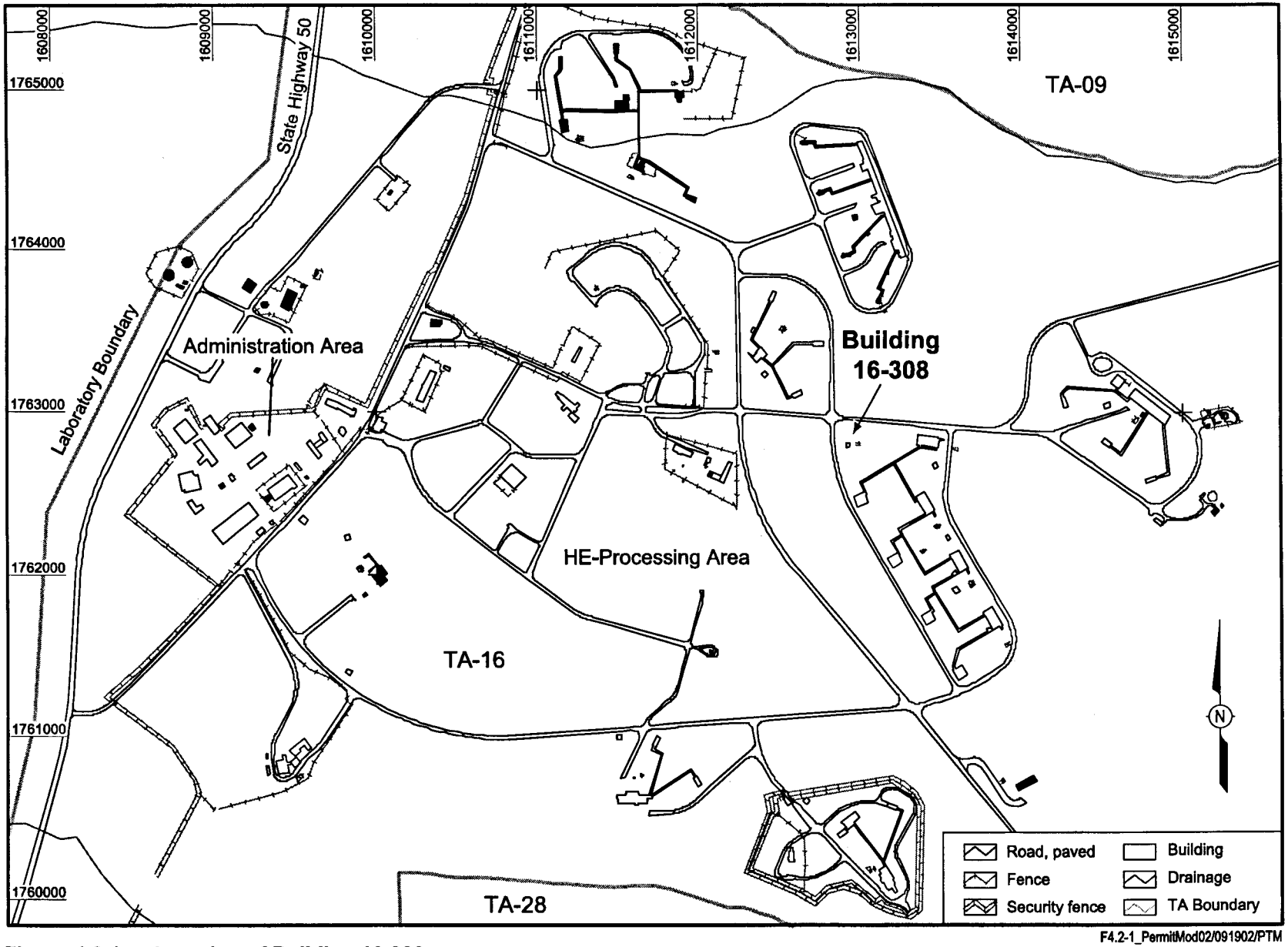
SWMU 16-026(f) consists of two outfalls (and associated drainlines) located at Building 16-308. Building 16-308 is located within the fenced HE-processing area at TA-16 (Figure 4.2-1). Building doors are padlocked at all times, and keys can be obtained only through a TA-16 access control officer and only with proper approval.

The building is a 9.3- x 16-ft concrete structure with a 6- x 16-ft loading dock. The one-floor building consists of one 8- x 10-ft and one 4- x 8-ft HE storage room, and an 8- x 14-ft basement. Each storage room has a separate exterior entrance with no access between the rooms. The basement can be accessed only from the exterior of the building through a manhole with a cast-iron ladder. (As-built Engineering Drawing ENG-C 15749 [sheet 25 of 127]) (Attachment A). Only personnel having Laboratory confined-space awareness training are permitted to enter the basement.

Building 16-308 contains three drains, all of which exit the building from the basement. The roof drain enters the basement at the northeastern corner of the basement ceiling and exits at the basement's northeastern wall (approximately 3.5 ft below grade) via a 4-in. cast-iron downspout drain that connects to a 4-in. vitrified clay pipe (VCP). The VCP continues underground to its point of discharge approximately 20 ft northeast of the building. Two 4-in. floor drains exit the southeastern basement wall (below grade) via a 4-in. cast-iron drainpipe that connects to a 4-in. VCP. The VCP continues underground to its point of discharge approximately 300 ft southeast of the building. Within the interior of the building, the roof drain system is an entirely closed system. (As-built Engineering Drawings ENG-C 15774 [sheet 50 of 127] [Attachment B]; ENG-C 15726 [sheet 2 of 127] [Attachment C]; Water Quality and Hydrology Group waste stream characterization report [Santa Fe Engineering 1992, 15321] [Attachment D]).

May 30, 2002, and June 24, 2002, site visits by ER personnel confirmed the information in the engineering drawings (Nonno 2002, 73591) (Attachment E).

SWMUs or AOCs in the proximity of SWMU 16-026(f) are (1) Consolidated Unit 16-029(e)-99, a former HE-sump with associated drainline and outfall, located approximately 180 ft to the south of SWMU 16-026(f) and (2) SWMU 16-016(e), a small surface disposal area, located approximately 60 ft south of SWMU 16-026(f).



F4.2-1_PermitMod02/091902/PTM

Figure 4.2-1. Location of Building 16-308

4.2.2 Operational History

Building 16-308 was constructed in 1951 and became operational in 1953 (LANL ER Records Package 730) (Attachment F). From 1951 through the present, the building has been used as a rest house. A rest house is an auxiliary building used for the intermediate storage of HE materials before processing. Specific activities during the building's use include drying nitrocellulose explosives (from 1951 to approximately 1969), storing detonators and squibs (HE initiators) (after 1969), and storing HE explosives (currently).

The SWMU report (LANL 1990, 07512, pp.16-026) (Attachment G) states that the drains associated with Building 16-308 received HE and barium. However, as-built Engineering Drawings ENG-C 15774 (sheet 50 of 127) (Attachment B) and ENG-C 15748 (sheet 24 of 127) (Attachment H) demonstrate that the roof drain was built exclusively to collect and disperse rainwater from the roof of Building 16-308 and the basement floor drains were built exclusively to receive low volumes of steam condensate from the heating system and water from the building's fire sprinkler system. Within the interior of the building, the roof drain system is an entirely closed system that receives no influent from any other source. This closed system completely prevents the possibility of the introduction of any foreign substance (such as HE) into the system. The SWMU report statement that the drains received HE and barium was apparently based on the general operational history of TA-16, rather than on a review of the engineering documentation specific to this building.

One inflow pipe that carries potable water for the fire sprinkler system enters the northwest corner of the basement (below ground). The basement is equipped with a steam pump and small compressor, which were associated with the building's steam heating system; the air compressor operated radiator control valves. The water line to the building has been shut off and the heating system equipment has been inactive for approximately 15 years. (Nonno 2002, 73591) (Attachment E).

From approximately 1984 until January 1997 (when the new TA-16 steam plant became operative), TA-16 steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. Amine was added to the steam once the steam exited the steam plant. The amine was injected into the steam pipe in liquid form and immediately vaporized as it came into contact with the steam. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the buildings at TA-16. No Laboratory or Johnson Controls Northern New Mexico (JCNNM) employees knowledgeable of pre-1984 TA-16 steam plant practices could be located for corroborative interviews. However, the gas and steam engineer for the Laboratory's Utilities and Infrastructures Group and a water treatment specialist employed by JCNNM both stated that, because water treatment technologies have changed very little over the past 50 years, there is no reason to believe that the Laboratory's pre-1984 practice for treating steam varied from the practice used post-1984. (Nonno 2000, 67381, pp. 5, 6) (Attachment I)

From the normal operation and maintenance of the compressor in the basement, small amounts of lubricating oil may have leaked and possibly entered the floor drains. However, because there is no staining on the basement's cement floor (Attachment E), an oil leak seems unlikely. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less (Attachment I, p. 3). In December 1995, both floor drains were plugged from within the basement (Water Quality and Hydrology Group waste stream characterization database printout) (Attachment J). Hence, the outfall associated with the floor drains is currently inactive.

4.3 Land Use

4.3.1 Current

TA-16 is an industrial area used for the research, development, processing, and testing of HE. It is a high-security, restricted-access area enclosed by a chain-link fence topped with barbed wire. Access to TA-16 is obtained only by passing through a security guard station. Within this outer fence, a second fence encloses certain HE-processing areas within TA-16. Access through this interior fence is obtained only by passing through a gate secured by a badge-reader. These security measures effectively eliminate the possibility of inadvertent site intrusion.

4.3.2 Future/Proposed

The Laboratory does not anticipate a change from the industrial restricted-access use of TA-16 for the operational life of the Laboratory (LANL 1995, 57224, pp. 11–12) (Appendix B, Attachment 1). Future industrial use of this TA will continue to include the research, development, processing, and testing of HE.

4.4 No Further Action Proposal

4.4.1 Rationale

The rationale for the NFA proposal for SWMU 16-026(f) is two-part, and described as follows.

For the drain system and outfall at the northeast corner of Building 16-308, the NFA proposal is based on the following:

- From the time of its construction to the present, this drain system and associated outfall have received only the periodic flow of rainwater from one roof drain.
- Within the interior of the building, this drain system is an entirely closed system that receives no influent from any other source.

For the drain system and outfall at the southeast corner of Building 16-308, the NFA proposal is based on the following:

- The only effluent discharged to the floor drains consisted of low volumes of steam condensate, potable water from the fire sprinkler system, and, possibly, *de minimus* amounts of oil.
- The steam condensate is currently composed of water only and was formerly composed of water containing amine, a commonly used additive for controlling pH and preventing corrosion and mineral buildup within piping. Amine does not meet the definition of RCRA hazardous wastes and/or constituents as provided in 20.4.1 NMAC, incorporating 40 CFR 261.3.
- It is possible that small amounts of oil resulting from the operation and maintenance of the compressor in the basement may have entered the floor drains. However, in 20.4.1 NMAC, incorporating 40 CFR 261.3(a)(2)(iv)(D), EPA set a precedent for excluding *de minimus* leaks (from devices used to transfer materials) from being considered as a solid and/or hazardous waste.
- Although the 1990 SWMU report states that the drains associated with Building 16-308 received HE and barium, as-built engineering drawings demonstrate that this building is configured in such a way that it would be extremely unlikely that these drains would have received these constituents. Each of the rooms within the building has a separate exterior entrance, and there is

no access between the rooms. The basement, where all drains exit the building, contains fire sprinkler and heating and ventilating equipment only. Access to the basement is very difficult; entry can be gained only from the exterior of the building through a manhole with a cast-iron ladder. Therefore, materials used in the HE-processing/storage area of the building would have extremely difficult access to the drains.

- In 1995, the floor drainlines were plugged from within the basement of the building and no longer discharge to a point outside of the building.

Thus, based on site visits and archival information, the RRES-R Program has demonstrated that the SWMU 16-026(f) outfalls and associated drainlines have not been used for the management (that is, generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes and/or constituents.

4.4.2 Criterion

Based on the information presented in Sections 4.2 through 4.4 of this proposal, SWMU 16-026(f) is being proposed for NFA under Criterion 2.

4.5 Supporting Documentation Attached

Attachment A: LASL Engineering Drawing ENG-C 15749 (sheet 25 of 127), dated 1951. (LASL 1951, 73481)

Attachment B: LASL Engineering Drawing ENG-C 15774 (sheet 50 of 127), dated 1951. (LASL 1951, 73482)

Attachment C: LASL Engineering Drawing ENG-C 15726 (sheet 2 of 127), dated 1951. (LASL 1951, 24071)

Attachment D: Relevant pages from the wastewater stream characterization report for TA-16-308. (Santa Fe Engineering 1992, 15321)

Attachment E: Nonno memo to file regarding Building 16-308 (Nonno 2002, 73591).

Attachment F: Relevant pages from the LANL TA-16 structure history book. (LANL ER Records Package 730)

Attachment G: LANL SWMU report, Volume II, pp. 16-026. (LANL 1990, 07512)

Attachment H: LASL Engineering Drawing ENG-C 15748 (sheet 24 of 127), dated 1951. (LASL 1951, 73482)

Attachment I: Nonno personal and telephone interviews regarding HE rest houses. (Nonno 2000, 67381)

Attachment J: Printout from the Water Quality and Hydrology Group's waste stream characterization database.

Appendix B, Attachment 1: LANL site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

4.6 References Used for Text of the Proposal for Permit Modification

LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1082, Addendum 2," Los Alamos National Laboratory report LA-UR-95-1038, Los Alamos, New Mexico, pp. 6-14 and 6-15. (LANL 1995, 57225)

Environmental Restoration Project, September 1998. "Chapter 6 of RFI Work Plan for OU 1082, Addendum 2, Rev.1," Los Alamos National Laboratory, Los Alamos, New Mexico, pp. 6-11 to 6-12. (Environmental Restoration Project 1998, 59685)

4.7 History of Regulatory Deliverables

LANL, July 5, 1995:	RFI work plan for Operable Unit (OU) 1082, Addendum 2, submitted to EPA, Region 6. (LANL 1995, 57225)
LANL, September 11, 1998:	Submittal of ecological and applicable or relevant and appropriate requirements (ARARs) revision of Chapter 6 of the RFI work plan for OU 1082, Addendum 2, to DOE as partial satisfaction of Functional Area A.2 Performance Measure. (LANL 1998, 59685)
NMED, Winter, 1998/1999:	NMED verbally requested that the ecological and ARARs revision of Chapter 6 of the RFI work plan for OU 1082, Addendum 2, not be submitted for NMED review because it would be more efficient to make the Chapter 6 NFA proposals via a first-pass Class III permit modification request. (LANL 1998, 59685) (Appendix B, Attachment 2)

At the time that Addendum 2 of the RFI work plan for OU 1082 was submitted for review, NMED had not yet fully developed its five criteria for NFA. The work plan proposed NFA based on four criteria, rather than five, and on human health evaluations only. In 1998, the ER Project evaluated the NFA recommendations made in Addendum 2 of the work plan against ecological risk and other applicable regulations and standards. In conjunction with the DOE, the ER Project wrote a replacement Chapter 6 for this work plan that

- applied the NFA criteria more recently developed by NMED;
- reevaluated the NFA proposals to include an evaluation of ecological risk as well as other applicable regulations and standards; and
- removed NFA proposals that were no longer viable based on the above two bullets.

In the winter of 1998/1999, a verbal agreement was made between Mr. Dave McInroy of the ER Project and Mr. John Kieling of the NMED Hazardous Waste Bureau. Mr. Kieling requested that the text of Chapter 6 of Addendum 2 of the OU 1082 work plan not be significantly modified in 1998, but the revised NFA proposals be submitted in a first-pass Class III request for permit modification (LANL 1998, 59685) (Appendix B, Attachment 2). Therefore, the Laboratory ER Project is making the NFA proposal for SWMUs 16-026(f) in this proposal for permit modification.

4.7.1 References for Regulatory Deliverables

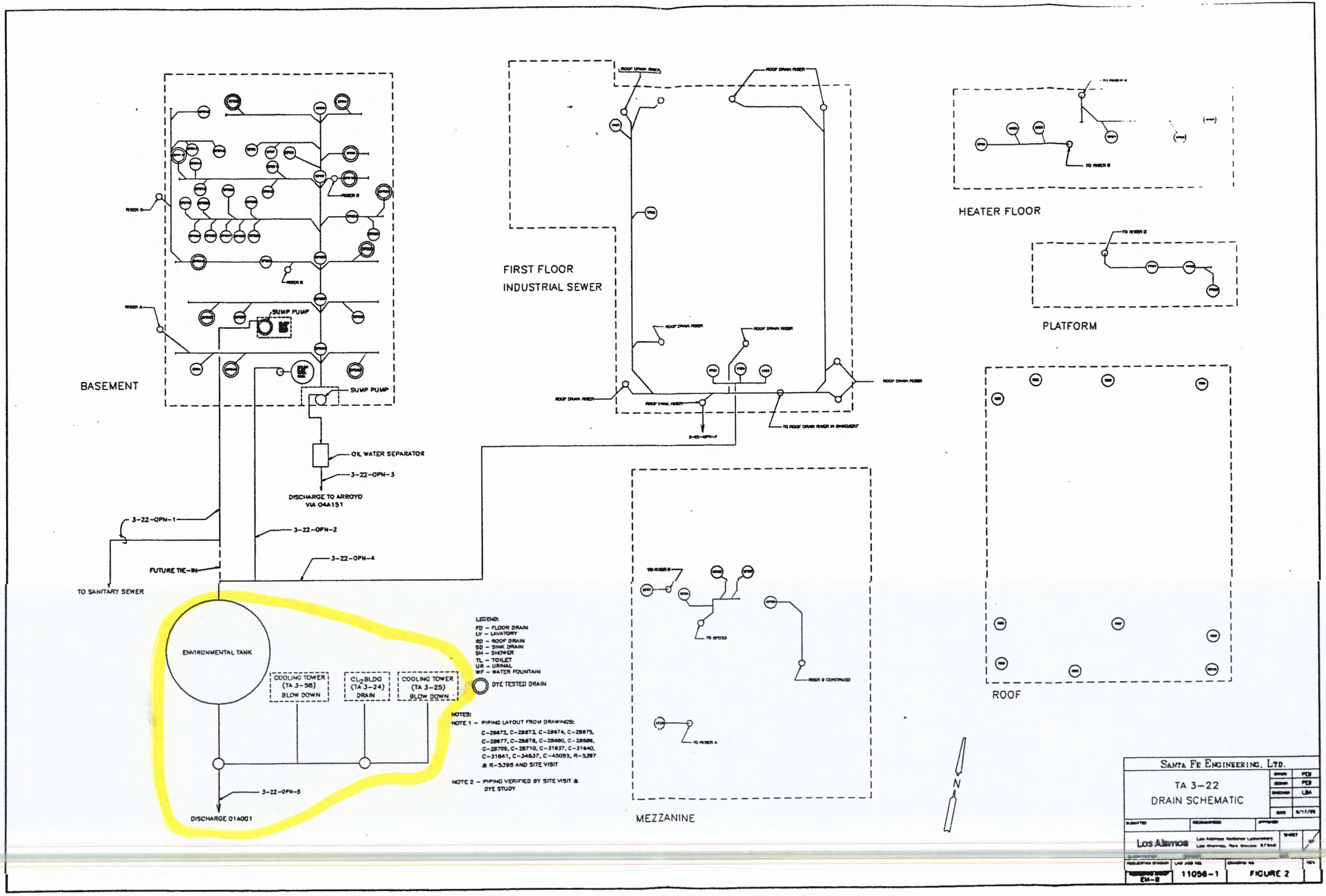
LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1082, Addendum 2," Los Alamos National Laboratory report LA-UR-95-1038, Los Alamos, New Mexico. (LANL 1995, 57225)

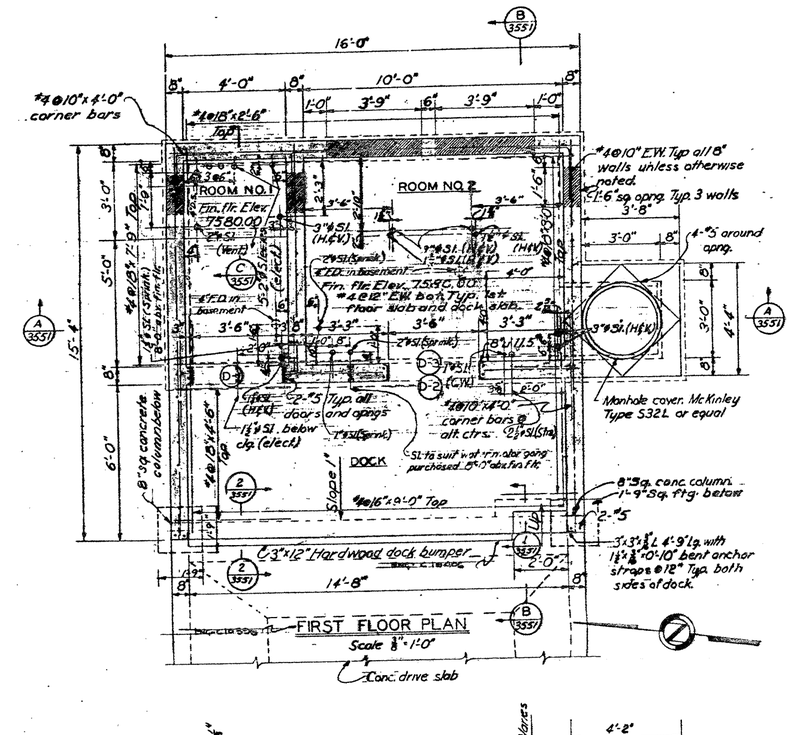
Environmental Restoration Project, September 1998. "Chapter 6 of RFI Work Plan for OU 1082, Addendum 2, Rev. 1," Los Alamos National Laboratory, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 59685)

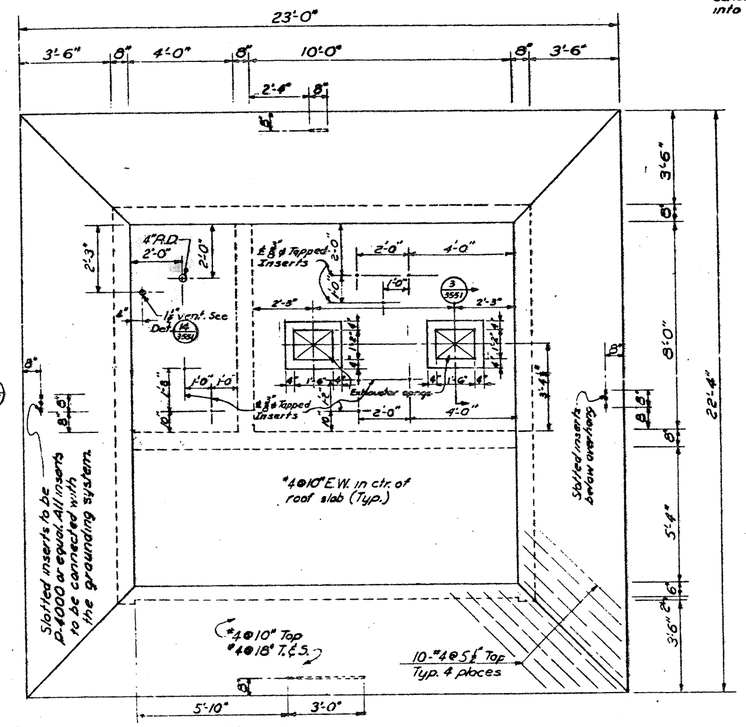
LANL (Los Alamos National Laboratory), September 11, 1998. "Rewrite of Chapter 6 Within RFI Work Plan for OU 1082 to Satisfy PM for Functional Area A.2," Los Alamos National Laboratory letter to T. Taylor (DOE-LAAO) from J. Canepa (ER Project), Los Alamos, New Mexico. (LANL 1998, 59685)

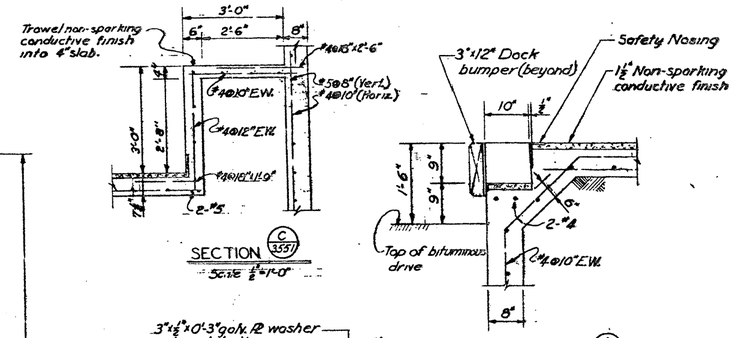
16-026(f)

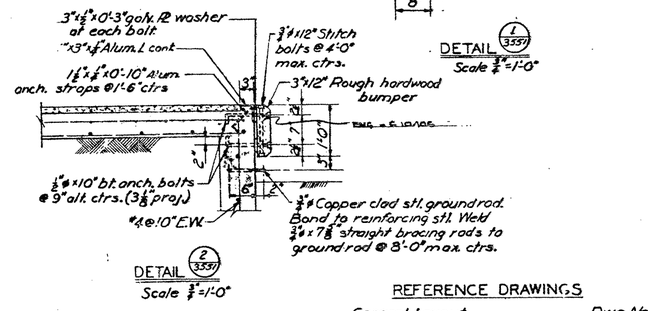
ATTACHMENTS


BASEMENT
SUMP PUMP
SUMP PUMP
OIL WATER SEPARATOR
3-22-OPN-3
DISCHARGE TO ARROYO
VIA 04A151
3-22-OPN-1
3-22-OPN-2
3-22-OPN-4
FUTURE TIE-IN
TO SANITARY SEWER
ENVIRONMENTAL TANK
COOLING TOWER
(TA 3-58)
BLOW DOWN
CL_2 BLDG
(TA 3-24)
DRAIN
COOLING TOWER
(TA 3-25)
BLOW DOWN
3-22-OPN-5
DISCHARGE 01A001
FIRST FLOOR
INDUSTRIAL SEWER
ROOF DRAIN RISER
TO ROOF DRAIN RISER IN BASEMENT
HEATER FLOOR
TO RISER B
PLATFORM
TO RISER B
ROOF
TO RISER B
TO SP033
RISER B CONTINUED
TO RISER A
MEZZANINE
N
LEGEND:
FD – FLOOR DRAIN
LV – LAVATORY
RD – ROOF DRAIN
SD – SINK DRAIN
SH – SHOWER
TL – TOILET
UR – URINAL
WF – WATER FOUNTAIN
DYE TESTED DRAIN
NOTES:
NOTE 1 – PIPING LAYOUT FROM DRAWINGS:
C-28672, C-28673, C-28674, C-28675,
C-28677, C-28678, C-28680, C-28686,
C-28709, C-28710, C-31637, C-31640,
C-31641, C-34837, C-45085, R-5397
& R-5398 AND SITE VISIT
NOTE 2 – PIPING VERIFIED BY SITE VISIT &
DYE STUDY
SANTA FE ENGINEERING, LTD.
TA 3-22
DRAIN SCHEMATIC
DRAWN FCB
DESIGN FCB
CHECKED LBA
DATE 6/11/95
Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545
EM-8
11056-1
FIGURE 2







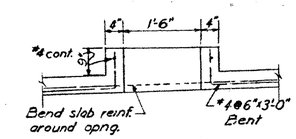


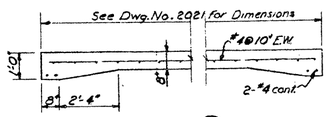
REFERENCE DRAWINGS

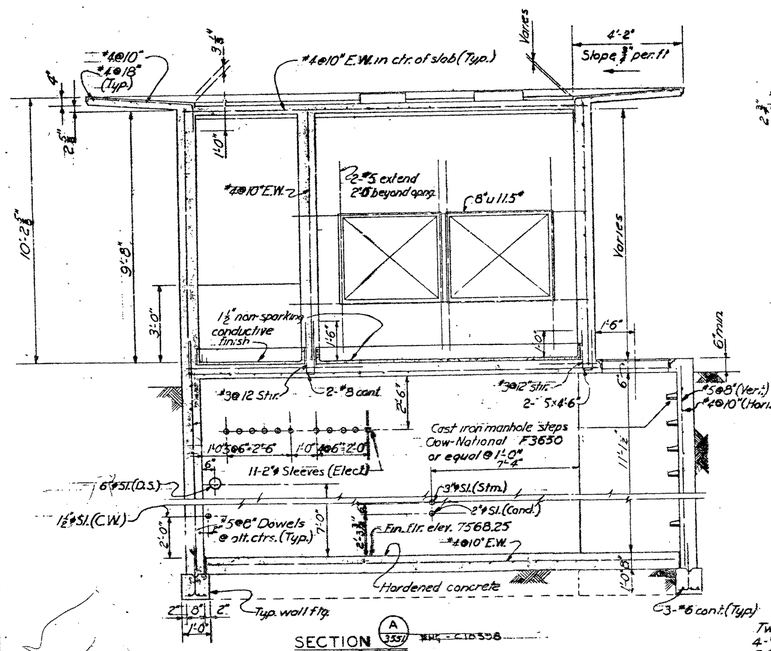
General Layout	Dwg. No. D2021
Lighting and Power Layout	D7511
Steam Connections for Heating	D4531
Plans, Elevations, Sections, and Details	D3511

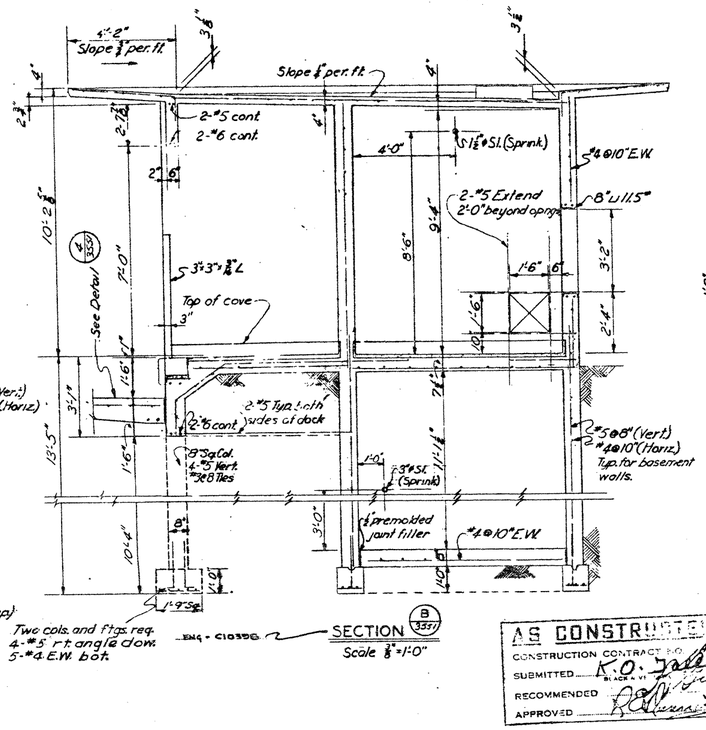
GENERAL NOTES

1. All concrete except roof fill material shall be Type A and shall develop a compressive strength of 3000 psi at 28 days. Roof fill shall be 1:12 mix pumice aggregate concrete. Mix ½ lb. cemex disperser with each sack of cement.
2. Reinforcement shall be intermediate grade deformed steel bars to conform to ASTM standard A305-49.
3. All metal including reinforcing steel shall be made electrically continuous and shall be connected to the grounding system. See specifications.
4. Where shown on the drawings concrete floor slabs shall be given a red colored non-sparking conductive finish.
5. Slabs shall be placed in 2 courses; top course to be ½" thick including the floor finish. Conductive finish shall be grounded.
6. Unless otherwise noted, all exposed concrete surfaces except floors shall be smooth finish. Other concrete surfaces, except floors shall be rough finish. See specifications for finish required.
7. Exterior building walls covered with earth shall be waterproofed with 3 plies felt and coal tar pitch.
8. Interior walls and ceiling and exposed metal shall be painted in accordance with the specifications.
9. Depths of all foundations and footings shown on the drawing are minimum depths. All footings, foundations, and piers shall be carried to solid bearing with a minimum excavation of 12 inches into rock. (tuff)
10. Foundation walls 6 inches below finish grade may be poured without forming, provided trenches are cut to size.
11. Location of all sleeves and inserts shall be checked in field against equipment purchased. Contractor shall make necessary changes to secure a satisfactory fit before concrete is placed.
12. All sleeves shall be Schedule 40 steel pipe. Sizes shown are inside diameters of sleeves. Caulk all sleeves with lead yarn.
13. Chamfer all outside corners of concrete beams.









VERIFIED UNCLASSIFIED
LANL Classification Group
Sandra L. Berlin 5-7
+ NOTUCDI
SLB 8/6/02

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AS CONSTRUCTED DRAWING
CONSTRUCTION CONTRACT NO. AT(29-1) 1234
SUBMITTED K.O. Talley
RECOMMENDED
APPROVED

NO.	DATE	REVISIONS	BY	CK.	PROJ. ENGR.	A.E.C. A.P.
2	4/6/61	DWG. NOS. REFER TO SHEET DWGS. 1015				
1	7-9-54	REVISED TITLE-BUILDING NUMBERS ADDED				

U. S. ATOMIC ENERGY COMMISSION
SANTA FE OPERATIONS OFFICE
LOS ALAMOS, NEW MEXICO

STRUCTURAL BUILDING (134-5) 16-308
PLANS, SECTIONS, AND DETAILS
T.A.-16 PROJECT "K"

CONTRACT NO. (A.E.C.) 470
A.E.C. ACCT. NO.
DRAWN H.C.L. 3-1-53
CHECKED ELE
A.E. APPROVED
DESIGN
PROJ. ENGR.
CHIEF ENGR.
SCALE AS NOTED
DATE 4/27/51
FILE NO. 3020

SUBMITTED
ARCHITECT-ENGINEER
RECOMMENDED
APPROVED

BLACK & VEATCH
CONSULTING ENGINEERS
KANSAS CITY, MISSOURI

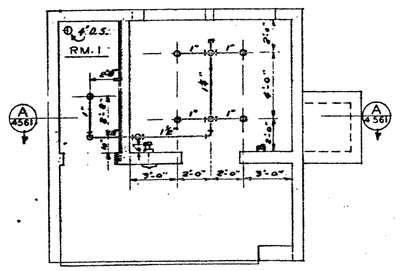
DRAWING NO. SFA-KH-D3551 SHEET 25 OF 127

LAB JOB 670

L.A.S.L. DWG. NO. ENG-C 15749

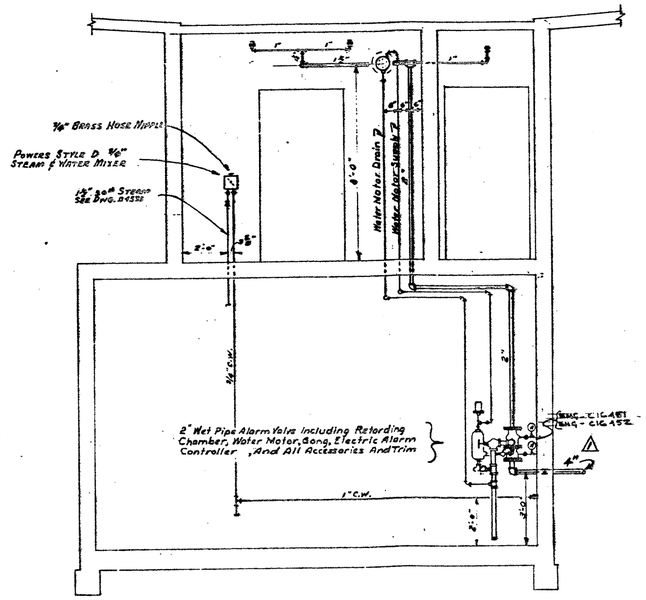
5683-A

Attachment A
16-026(f)



FIRST FLOOR PLAN

SCALE: $\frac{1}{4}$" = 1'-0"



SECTION A 4561

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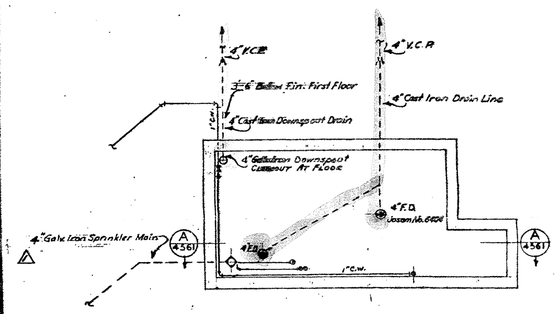

BASEMENT PLAN

SCALE: $\frac{1}{4}$" = 1'-0"

GENERAL NOTES

1. Sprinkler System Shown Shall Conform To All Applicable Sections Of The Specifications To This Contract.
2. Material Or Equipment Equal To That Specified Will Be Acceptable.
3. System Shall Be Closed Head Wet Pipe, 1/2" Orifice, 150°F. Operating Temperature With Extra Hazard Spacing.
4. Size Of Pipe Hanger Rod And Spacing Shall Be As Required In N.B.F.U. Pamphlet 13.
5. Where Piping Extends Thru Wall Or Floor The Opening Shall Be Properly Sleeved And Caulked.

REFERENCE DRAWINGS

04591 - Mechanical - Steam Connections For Heating

AS CONSTRUCTED DRAWING
CONSTRUCTION CONTRACT NO. AT(29-1)1284
SUBMITTED
RECOMMENDED
APPROVED

VERIFIED UNCLASSIFIED
LANL Classification Group
Sandra L Bordner S-7
8/6/02
+NOT UCNI
SLB

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NO.	DATE	REVISIONS	BY	CK.	PROJ. ENGR.	A.&C. APP.
3	7-8-55	ENG. NOS. REFER TO DNEF DWG. NOS.	GFS			
2	7-12-54	REVISED TITLE - BUILDING NUMBER ADDED	RCM	JAS		
1	7-11-54	CHANGE SIZE OF PIPE SHOW C.W. LINE				

U. S. ATOMIC ENERGY COMMISSION
SANTA FE OPERATIONS OFFICE
LOS ALAMOS, NEW MEXICO

MECHANICAL BUILDING (34-5) 16-308
PLUMBING AND SPRINKLER LAYOUT
TA-16 PROJECT "K"

CONTRACT NO. (A.E.C.) AT(29-1)1284
A.E.C. ACCT. NO.
DRAWN WSL
CHECKED
A-E APPROVED
DESIGN
PROJ. ENGR.
CHIEF ENGR.
SCALE AS NOTED
DATE 4-6-50
FILE NO. 3242

SUBMITTED May 7, 11
ARCHITECT-ENGINEER
RECOMMENDED
APPROVED

BLACK & VEATCH
CONSULTING ENGINEERS
KANSAS CITY, MISSOURI

DRAWING NO. SFA-K-D4561 | SHEET 50 | OF 127

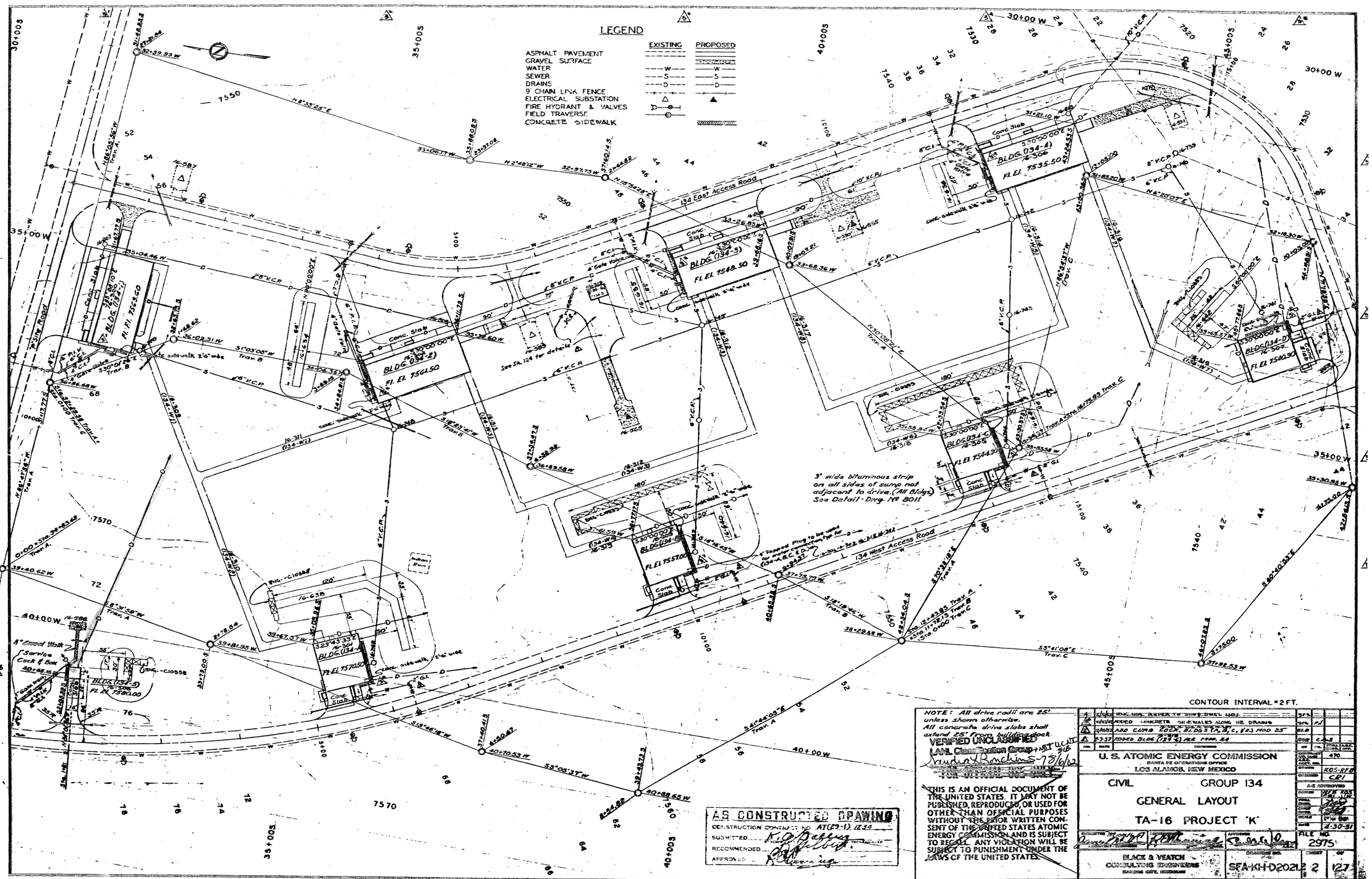
LAB JOB 670

L.A.S.L. DWG. NO. ENG-C [redacted] 15774

5683-B

Attachment B

16-026(f)



5683-C

Attachment C

16-026(F)

Attachment D

16-000526

16-026(f)

139

WASTEWATER STREAM CHARACTERIZATION FOR TA 16-300, 301, 302, 303, 304, 305, 306, 307, 308 AND 319

at

Los Alamos National Laboratory

Los Alamos Environmental Restoration Records Processing Facility

ER Record I.D.# 0015321

ENVIRONMENTAL STUDY

CHARACTERIZATION REPORT #2

Received by ER-RPF
JUN 17 1993
YCG

Los Alamos

ENVIRONMENTAL MANAGEMENT DIVISION
Los Alamos National Laboratory

10.2 Outfall 16-307-OPN-2

The flow to this outfall is from a steam pit and seeps under ground. This outfall should be covered under an NOI or the bottom drain plugged. No EPA forms were prepared.

10.3 Outfall 16-307-OPN-3

This outfall flows to the TA-16 sanitary sewer system. No changes or permitting are recommended. No EPA forms were prepared.

10.4 Outfall 16-307-OPN-4

This daylight outfall receives flow from two roof drains. No permitting or changes are recommended. No EPA forms were prepared.

10.5 Outfall 16-307-OPN-5

This outfall is a steam vent to atmosphere. This outfall should be covered under an NOI. No permitting or changes are recommended. No EPA forms were prepared.

11.0 RECOMMENDATIONS FOR BUILDINGS 308

This is a process building. Table 10 is a list of the drains to the building outfalls and Figure 10 is a schematic of the piping. The table lists the drains that connect to the outfall piping and includes recommendations for changes to the piping. The discussion below gives the reasoning for the recommendations.

11.1 Outfall 16-308-OPN-1

This outfall receives flow from two floor drains. The drains receive condensate, fire water and potable water. The flow is

low and the destination could not be determined. This outfall should be repiped to the sanitary sewer system. No permitting is recommended. No EPA forms were prepared.

11.2 Outfall 16-308-OPN-2

This daylight outfall receives flow from a roof drain (RD1). The outlet of this discharge was not located. The outlet should be located or the outfall repiped. No permitting is recommended. No EPA forms were prepared.

12.0 RECOMMENDATIONS FOR BUILDINGS 319

This is an office building that was not entered by SFE. All sources to the outfalls were verified by WX-12. Table 11 is a list of the drains to the building outfalls and Figure 11 is a schematic of the piping. The table lists the drains that connect to the outfall piping and includes recommendations for changes to the piping. The discussion below gives the reasoning for the recommendations.

12.1 Outfall 16-319-OPN-1

This outfall flows to the TA-16 sanitary treatment plant sewer system. No chemicals are used in the building and no changes are recommended for this outfall. No permitting is needed. No EPA forms were prepared.

12.2 Outfall 16-319-OPN-2

This outfall receives flow from the roof. The water runs directly onto the ground from the roof. No changes or permitting are recommended. No EPA forms were prepared.

TABLE 10: TA 16-308 DRAIN SUMMARY

OUTFALL NUMBER	ID NUMBER	ROOM ACTIVITY	STATUS OR RECOMMENDATIONS	EPA FORMS PREPARED
16-308-OPN-1	BFD1	Equipment Room	Repipe to San Sewer	No
	BFD2	Equipment Room	Repipe to San Sewer	
16-308-OPN-2	RD1	Roof	No change	No

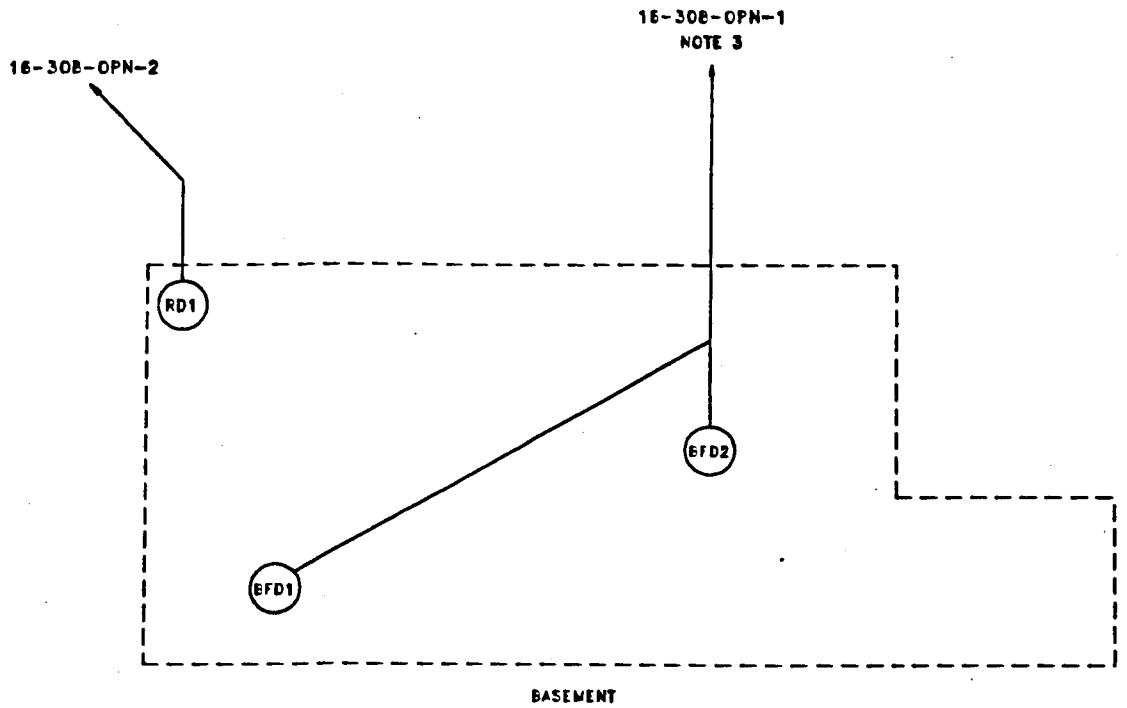
TABLE 11: TA 16-319 DRAIN SUMMARY

OUTFALL NUMBER	ID NUMBER	ROOM ACTIVITY	STATUS OR RECOMMENDATIONS	EPA FORMS PREPARED
16-319-OPN-1	1FD1	Office	No change	No
San Sewer	1WF1	Office	No change	
16-319-OPN-2	RD1	Roof	No change	No

RECOMMENDATIONS WERE REVIEWED WITH PERSONNEL FROM WX-12, EM-8 & ENG-6.

REPORT 2

TA	BLDG	OUTLET PIPING NUMBER	EPA OUTFALL #	DRAIN #	ROOM DESCRIPTION	FLOW	RATE	PERIODICITY	SEASONAL	ROOM #	SOURCE TYPES
16	307	16-307-OPN-1		SPD2	PROCESS BAY	100	GPY	4 DAYS PER WEEK	no	102	WASHDOWN
16	307	16-307-OPN-2		1STD1	EQUIPMENT ROOM			FLOW IS NIL	no	105	STEAM CONDENSATE
16	307	16-307-OPN-3	03S	1FD1	EQUIPMENT ROOM			FLOW IS NIL	no	105	FLOOR WASHINGS
16	307	16-307-OPN-3	03S	1FD2	BATHROOM FLOOR DRAIN			FLOW IS NIL	no	103	FLOOR WASHINGS
16	307	16-307-OPN-3	03S	1FD3	BATHROOM FLOOR DRAIN			FLOW IS NIL	no	104	FLOOR WASHINGS
16	307	16-307-OPN-3	03S	1FD4	EQUIPMENT ROOM			FLOW IS NIL	no	105	FLOOR WASHINGS
16	307	16-307-OPN-3	03S	1FD5	EQUIPMENT ROOM			FLOW IS NIL	no	105	FLOOR WASHINGS
16	307	16-307-OPN-3	03S	1FD6	EQUIPMENT ROOM			FLOW IS NIL	no	105	FLOOR WASHINGS
16	307	16-307-OPN-3	03S	1FD7	EQUIPMENT ROOM			FLOW IS NIL	no	105	FLOOR WASHINGS
16	307	16-307-OPN-3	03S	1FD8	EQUIPMENT ROOM			ONCE OR TWICE A YEAR	no	105	FIRE WATER BLOWDOWN
16	307	16-307-OPN-3	03S	1FD8	EQUIPMENT ROOM			FLOW IS NIL	no	105	CONDENSATE
16	307	16-307-OPN-3	03S	1FD8	EQUIPMENT ROOM			FLOW IS NIL	no	105	VACUUM PUMP
16	307	16-307-OPN-3	03S	1LV1	REST ROOM			4 DAYS PER WEEK	no	104	SANITARY WASTE
16	307	16-307-OPN-3	03S	1LV2	REST ROOM			4 DAYS PER WEEK	no	103	SANITARY WASTE
16	307	16-307-OPN-3	03S	1S1	PROCESS BAY			4 DAYS PER WEEK	no	102	HAND WASHING
16	307	16-307-OPN-3	03S	1S2	REST ROOM			4 DAYS PER WEEK	no	104	HAND WASHING
16	307	16-307-OPN-3	03S	1T1	REST ROOM			4 DAYS PER WEEK	no	104	SANITARY WASTE
16	307	16-307-OPN-3	03S	1T2	REST ROOM			4 DAYS PER WEEK	no	103	SANITARY WASTE
16	307	16-307-OPN-3	03S	1UR1	REST ROOM			4 DAYS PER WEEK	no	104	SANITARY WASTE
16	307	16-307-OPN-3	03S	1WF1	CORRIDOR			HIGHER IN SUMMER	no	CORRIDOR 3	DRINKING WATER
16	307	16-307-OPN-4		RD1	ROOF DRAIN			MOSTLY IN SUMMER	no	ROOF	RAIN
16	307	16-307-OPN-4		RD2	ROOF DRAIN			MOSTLY IN SUMMER	no	ROOF	RAIN
16	307	16-307-OPN-5			EQUIPMENT ROOM			FLOW IS NIL	no	105	STEAM VENT
16	308	16-308-OPN-1		BFD1	EQUIPMENT ROOM			ONCE OR TWICE A YEAR	no	BASEMENT	FIRE WATER
16	308	16-308-OPN-1		BFD1	EQUIPMENT ROOM			FLOW IS NIL	no	BASEMENT	CONDENSATE
16	308	16-308-OPN-1		BFD1	EQUIPMENT ROOM			FLOW IS NIL	no	BASEMENT	POTABLE WATER
16	308	16-308-OPN-1		BFD2	EQUIPMENT ROOM			FLOW IS NIL	no	BASEMENT	AIR COMPRESS KO POT
16	308	16-308-OPN-2		RD1	ROOF DRAIN			MOSTLY IN SUMMER	no	ROOF	RAIN
16	319	16-319-OPN-1	03S	1FD1	OFFICE FLOOR DRAIN			FLOW IS NIL	no	100	FLOOR WASHINGS
16	319	16-319-OPN-1	03S	1WF1	OFFICE			HIGHER IN SUMMER	no	100	DRINKING WATER
16	319	16-319-OPN-2		RD1	ROOF DRAIN			MOSTLY IN SUMMER	no	100	RAIN WATER



GEND:
- FLOOR DRAIN
- ROOF DRAIN

TES:
TE 1 - PIPING LAYOUT FROM DRAWING ENG-C15774.

TE 2 - ACTUAL PIPING DETERMINED FROM DRAWINGS, AS NOTED, WX-12 DYE VERIFICATION, AND SITE INSPECTION.

TE 3 - END OF PIPE NOT FOUND.

SANTA FE ENGINEERING, LTD.		
TA 16-308 BUILDING DRAIN SCHEMATIC	DRAWN	MSC
	DESIGN	MSC
	CHECKED	PEB
	DATE	3/17/92
SUBMITTED	RECOMMENDED	APPROVED
Los Alamos — Los Alamos National Laboratory, Los Alamos, New Mexico 87545	SHEET	OF
CLASSIFICATION	REVIEWER	DATE
REQUESTING DIVISION	LAB JOB NO.	DRAWING NO.	REV.
REQUESTING GROUP	11056-2	FIGURE 10	

Attachment E

16-026(f)

E/ER MEMO TO FILE

DATE: September 12, 2002

FROM: Linda Nonno, RRES-R Regulatory Compliance Focus Area

SUBJECT: Site visits to Building 16-308, HE rest house

BACKGROUND:
In preparation for writing the September 2002 Petition for Permit Modification, verification of engineering drawings supporting NFA determinations for SWMU 16-026(f) was required. SWMU 16-026(f) consists of two outfalls (and associated drainlines) located at Building 16-308. One outfall discharges water from a roof drain; the other outfall serves two floor drains in the basement. A site visit was made to TA-16 on May 30, 2002, and follow-up visits were made to Building 16-308 on June 24 and September 12, 2002, in order to take photographs of the basement. The follow-up visits were required because access to the basement of the building is limited to personnel having confined-space training. This requirement is posted on the building above the manhole access to the basement.

DESCRIPTION OF SITE VISITS TO BUILDING 16-308, 16-026(f), May 30, 2002; June 24, 2002; and September 12, 2002

Investigators: Linda Nonno, RRES-R Regulatory Compliance Team, accompanied by Jim Nuttall (ESA), TA-16 Facility Coordinator, 667-4975, 664-1164 (pager) and Humberto Martinez (ESA), TA-16 Transportation Supervisor, 667-6792, 664 2048 (pager).

May 30, 2002

Before making our site visit to Building 16-308, I met with Jim Nuttall to review the drain summary for the building as listed in the Wastestream Characterization database (maintained by the Laboratory's RRES - Water Quality and Hydrology Group). According to the database, drain BFD1 receives potable water, fire system water, and condensate. I told Jim that I could explain the fire system water, because this system appears on one of the engineering drawings. I went on to tell him that I was fairly sure the condensate was from the building's steam heating system and the potable water was the water coming into the building, and I asked him to verify these items for me. Jim confirmed that the potable water is the water coming into the building for the fire sprinkler system and the condensate is from the building's steam heating system. He also said that the air compressor was associated with the steam heating system; the air compressor operated radiator control valves.

Next, Jim and I met the facility's Transportation Manager, Humberto Martinez, at Building 16-308. Humberto unlocked the doors to both storage rooms for me. As a safety precaution, we didn't enter either room because there were several mouse droppings in each room and we wanted to avoid the possibility of contracting hantavirus. However, each storage room is very small and could easily be viewed by standing outside of its doorway. Each room contained small amounts of explosives stored on shelves. Pipes from the steam heating system extend along one wall of each room and pipes from the fire sprinkler systems are present on the ceiling of each room; neither room contains a floor drain. Both the steam and fire sprinkler pipe systems are entirely closed systems, thus preventing the possibility for the intrusion of any foreign element (such as HE) into the system. Humberto, who has worked at TA-16 for over 30 years, told me that the water line to Building 308 has been shut off for at least 15 years. He explained that one winter the heating system temporarily failed and the water pipes in the basement had burst. Because the burst pipes had caused quite an inconvenience and because

the building was so small that personnel spent only brief periods of time actually in the building (only when removing an item from or adding an item to storage), TA-16 administrative management decided that it was too much trouble to keep the water flow to the building operational. Humberto also stated that the building's heating equipment has been inactive for approximately 15 years.

A see-through grate covers the manhole to the basement. Through the grate cover we were able to see only partially into the basement. The manhole is posted with a sign stating that only confined-space-trained personnel may enter the basement. The posted confined space number is HS-5 CSP 0172.

Before leaving Building 16-308, we located the roof drain outfall approximately 10-12 ft east and slightly north of the building's northeast corner. We weren't able to locate the floor drain outfall.

June 24, 2002 and September 12, 2002

During the June 24th site visit, a digital camera was brought to the site and confined-space-trained personnel tried to take photographs of the basement equipment and drain systems. Several rainstorms had occurred the weekend before June 24th, and the basement contained 2-3 in. of water. In addition, after only a few photographs, the camera batteries went dead. Therefore, it was necessary to schedule a second visit to complete taking photographs. Although several attempts were made to reschedule confined-space personnel during July and August, it was not possible to do so until September 12th.

According to the Water Quality and Hydrology Group waste stream characterization database, both floor drains had been plugged with cement grout. This was confirmed both through photographs and by the fact that during the June 24th and September 12th site visits the basement had 1-3 in. of accumulated rainwater. If the floor drains had not been plugged, the rainwater would have drained and not accumulated. Although the basement floor was covered in water, the camera flash provided enough light to show the plugged drains and also to show that the floor was not stained. Photographs taken during the June 24th and September 12th site visits are included as an attachment.

Linda Nonno 09/12/02

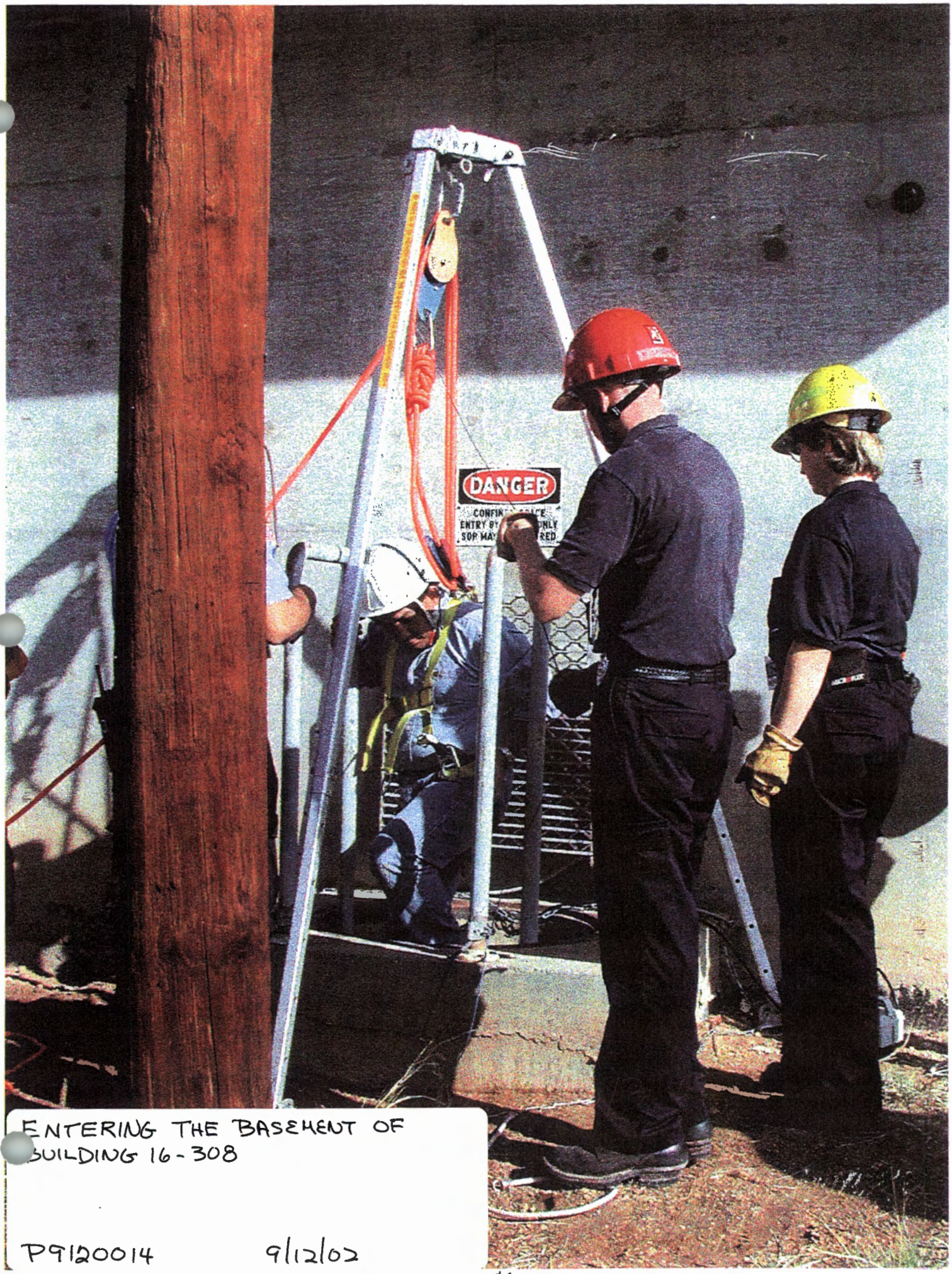
Linda Nonno

Attachment: Photographs of Building 16-308 basement

CHECKING AIR QUALITY BEFORE ENTERING THE BASEMENT OF BUILDING 16-308

P912

P101001 glinton



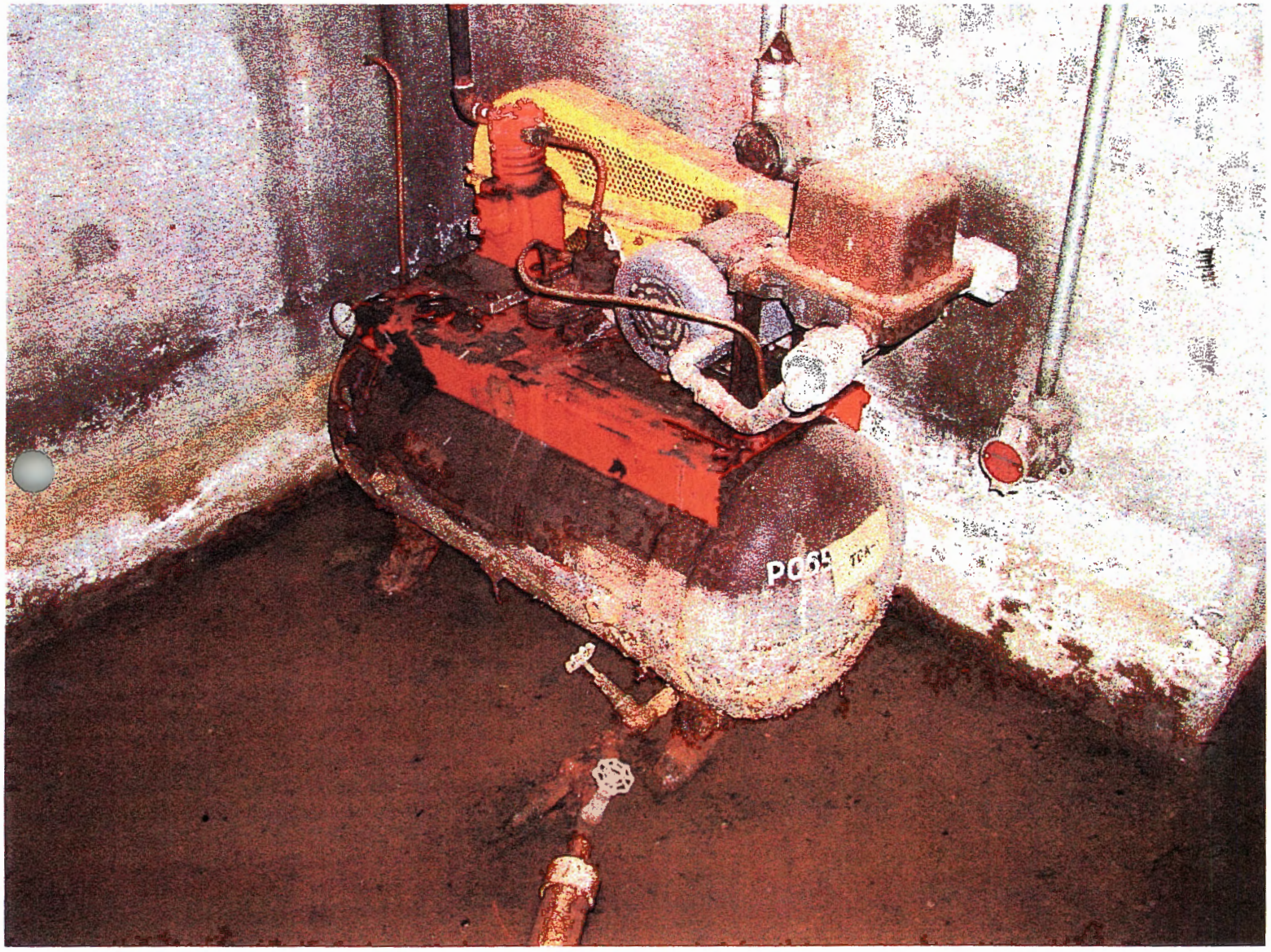
ENTERING THE BASEMENT OF
BUILDING 16-308

P9120014 9/12/02

P/01 0003

Compressor drain (plugged with cement grout) located near south wall of Building 16-308 basement

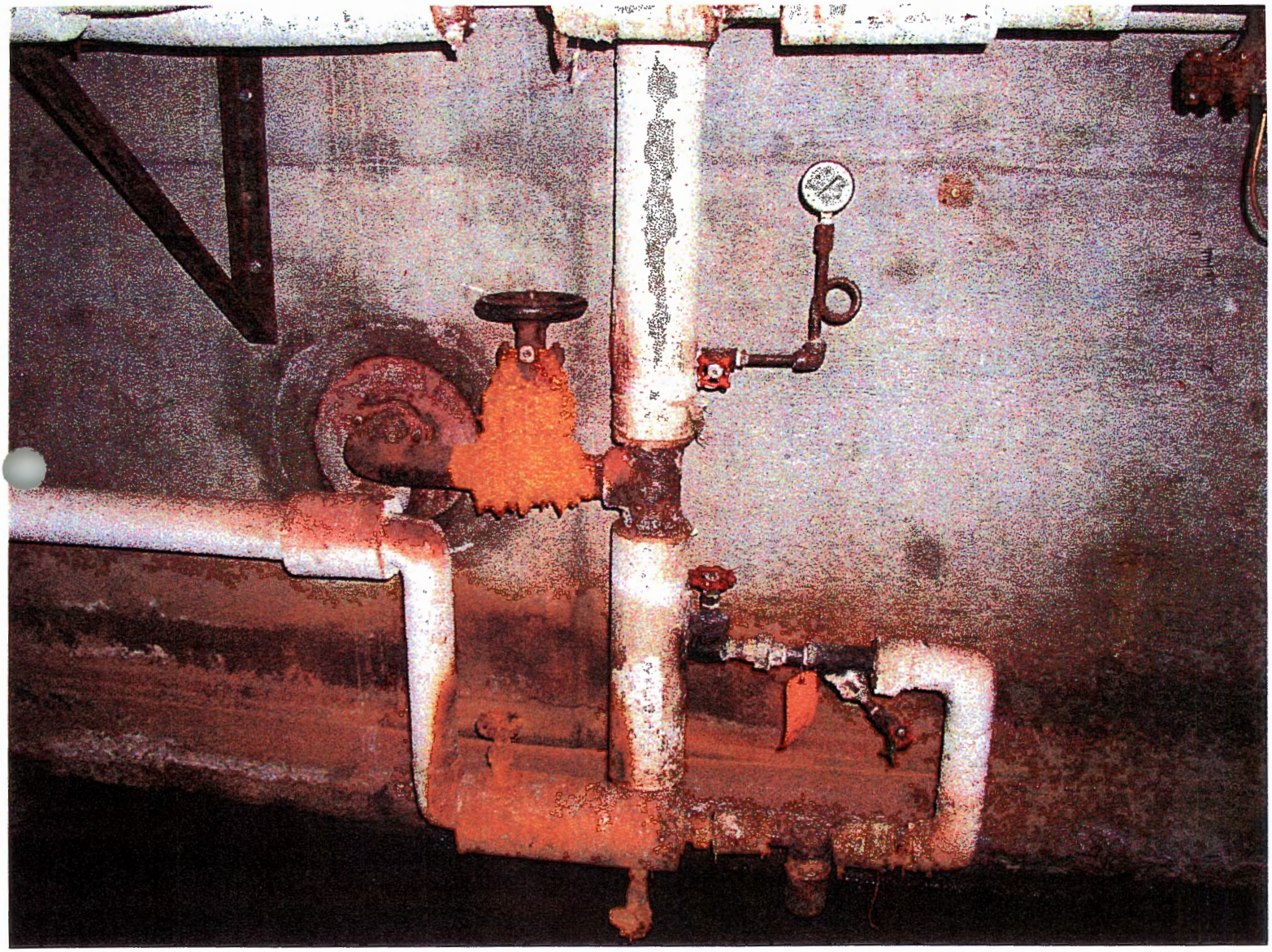
9/12/02



P1010004

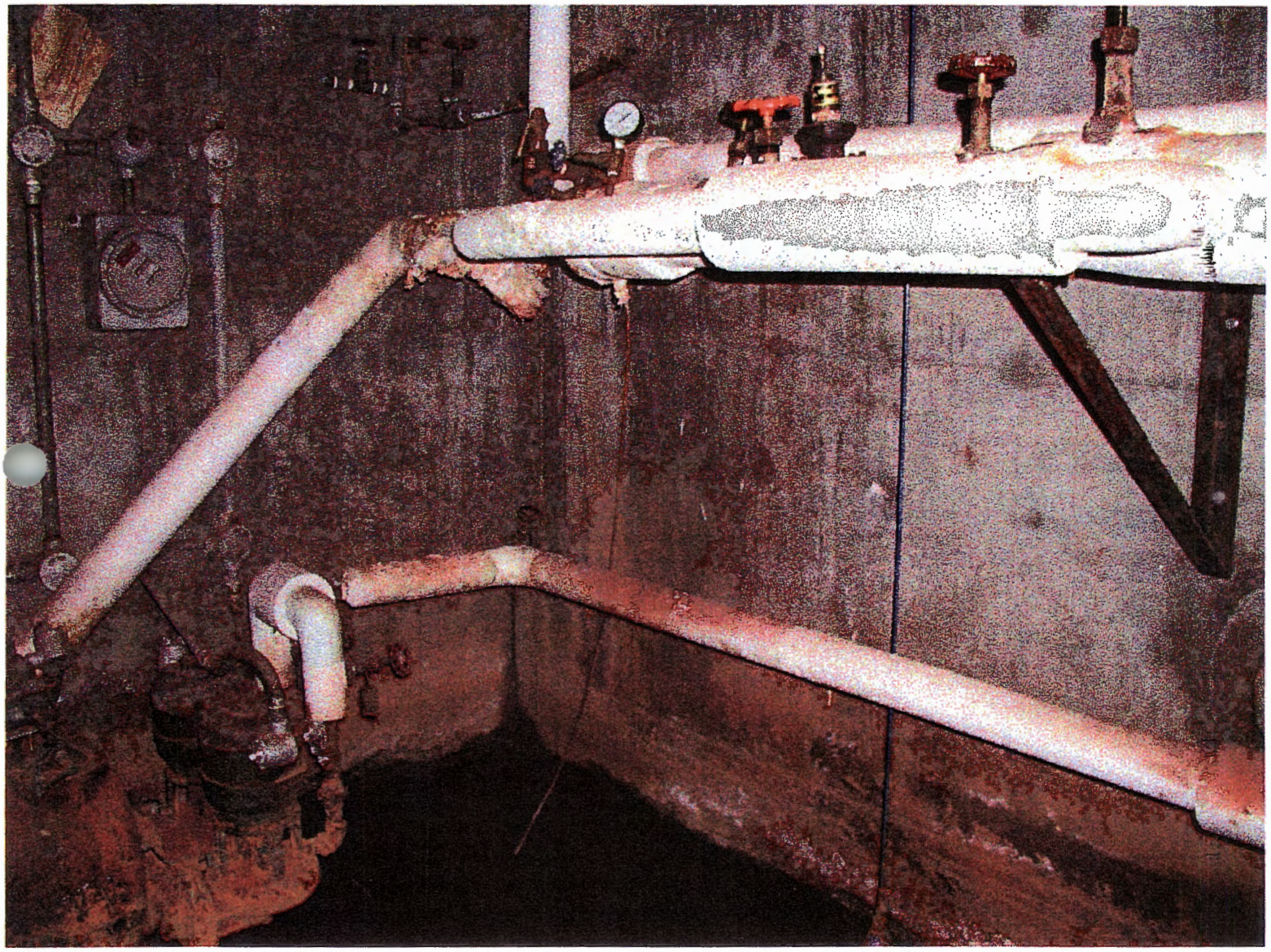
Compressor located in southeast corner of Building 16-308 basement

9/12/02



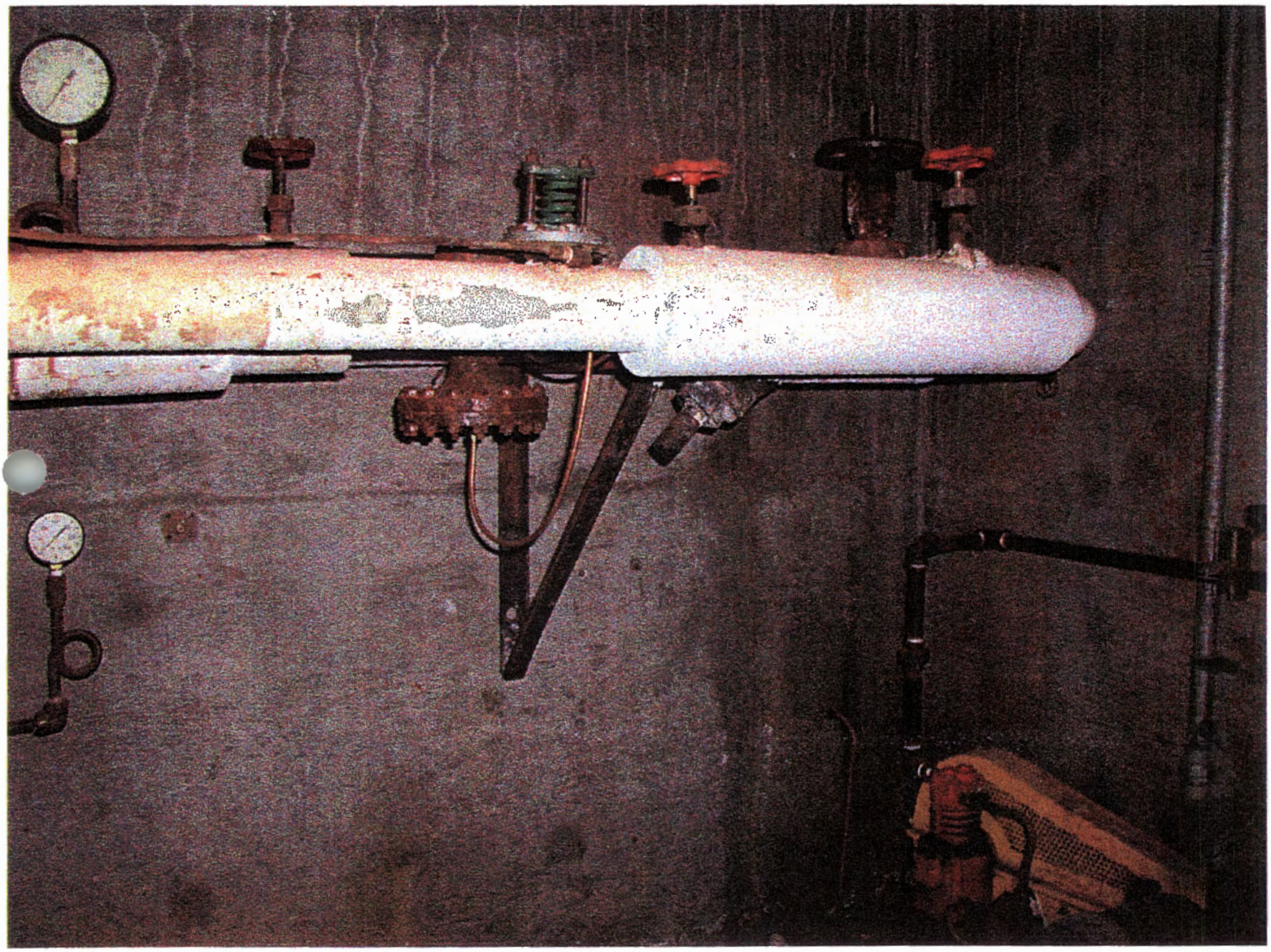
P1010006 Steam piping located on east wall of Building 16-308 basement

9/12/02



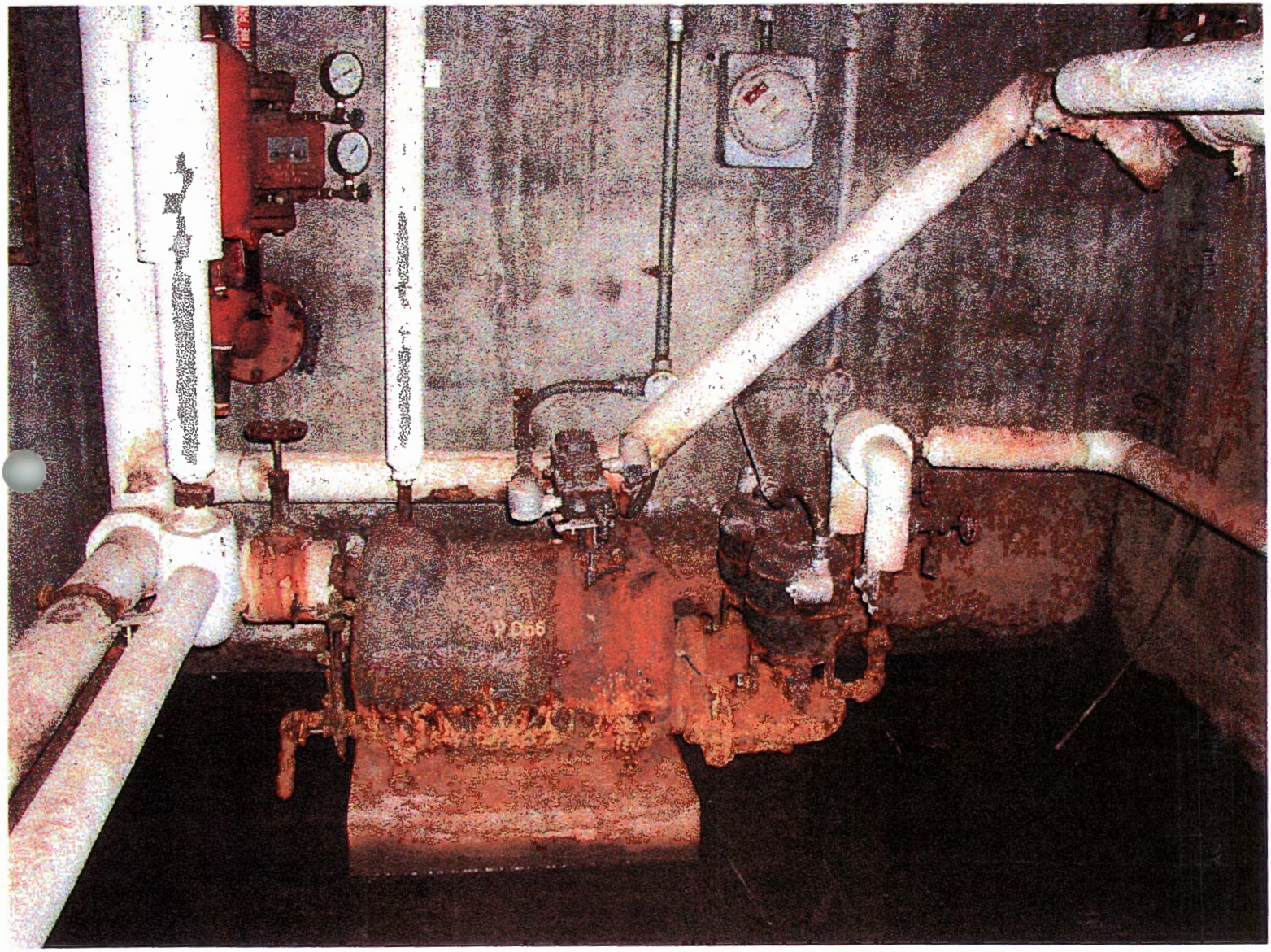
P1010007 Steam piping located on east and north walls of Building 16-308 basement (facing NE corner)

9/12/02



P1010005 Steam piping located on east wall of Building 16-308 basement

9/12/02

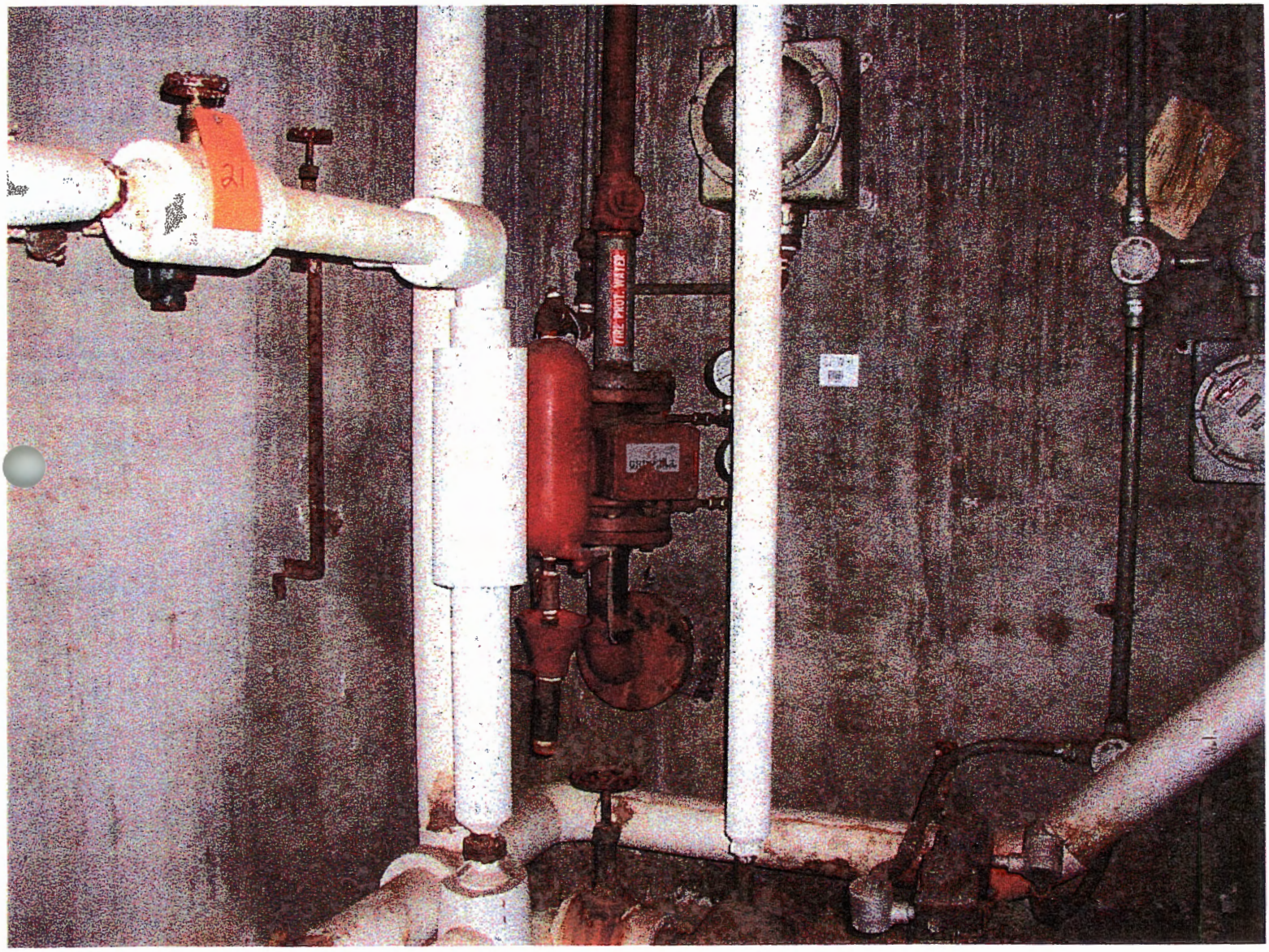


P1010009

Foreground: Steam condensate tank, pumps, and piping

Background: Fire sprinkler protection system in left corner behind steam pipe

(Facing north) 9/12/02



P1010010

Foreground: Steam piping

Background: Fire sprinkler protection equipment

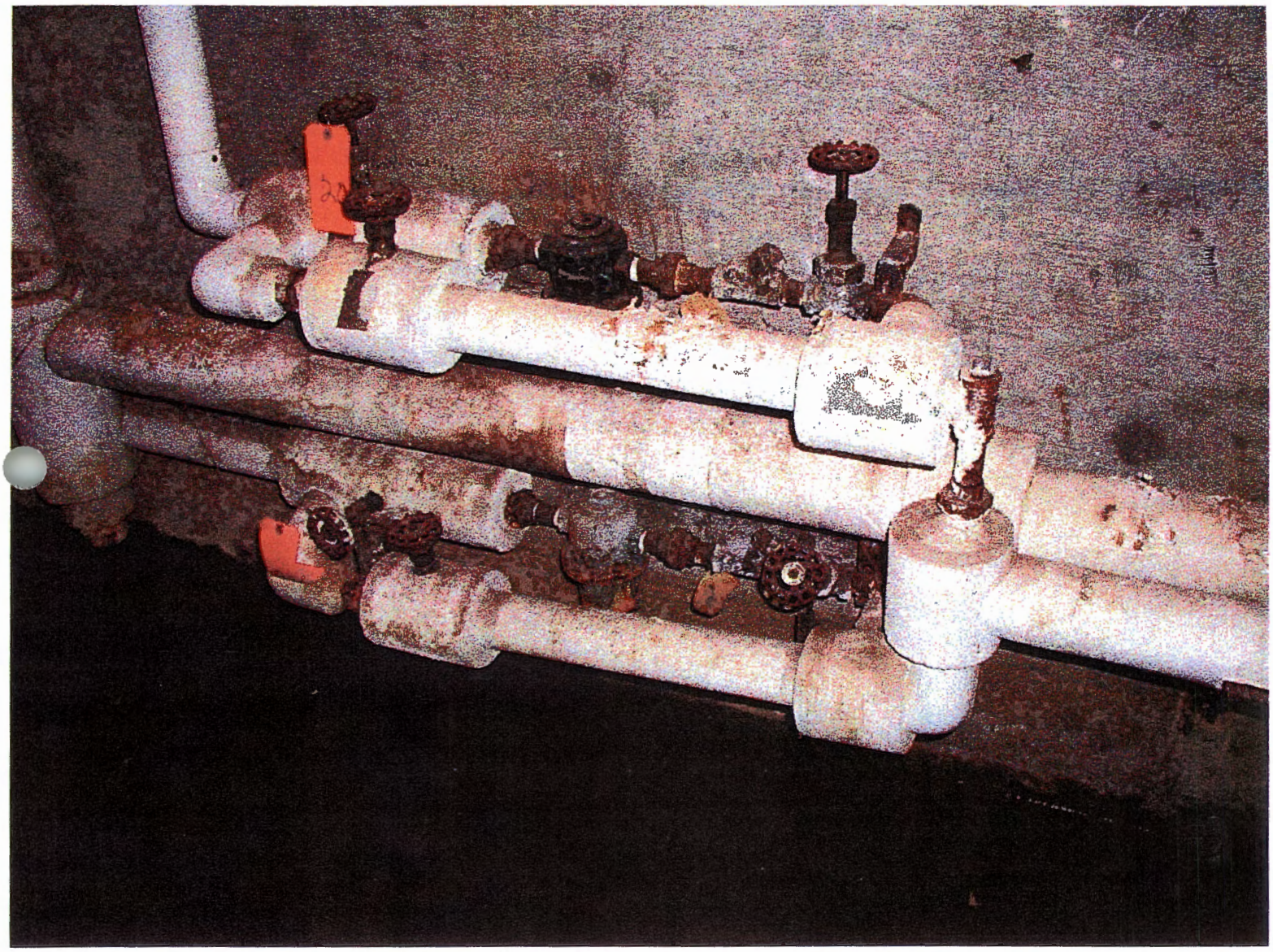
(Facing NW)

9/12/02

P/01/0011

Floor drain (plugged with cement grout) at NW corner of Building 16-308 basement floor

9/12/02



P101 0012 Steam traps located on west wall of Building 16-308 basement

9/12/02

P1010013

NE corner of Building 16-308 basement ceiling showing closed roof drain system emerging from 1st floor storeroom

9/12/02

P1010014

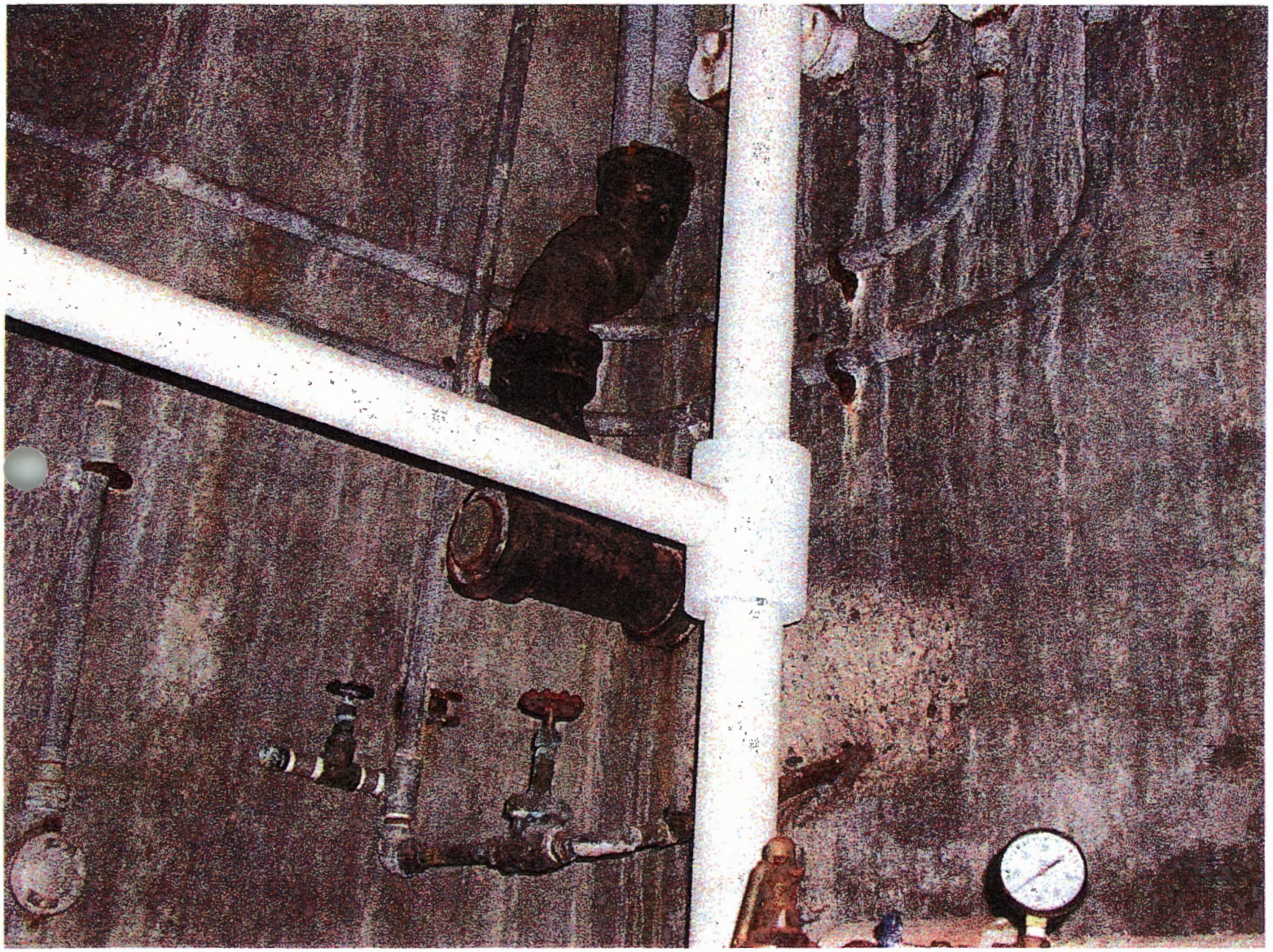
Northwest corner of Building 16-308 basement ceiling showing water sprinkler protection system piping (painted red)

9/12/02

Background: Closed-system roof drain pipe exiting east wall of Building 16-308 basement

Foreground: Steam piping

(Facing NE)



~~P00~~ P91200 12

9/12/02

P6250005 BUILDING 16-308 ROOF-DRAIN OUTFALL

SWMU CROSS-REFERENCE LIST
(continued)

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
16-026(w)	**		Tsk 14 : 425	TA-16-45
16-026(x)	**		Tsk 14 : 441	TA-16-437
16-026(y)	**		Tsk 14 : 455	TA-16-411
16-026(z)	TA16-5-O/CA-A/I-HW/RW		Tsk 13 : 191 192	TA-16-306

** No corresponding E. R. Program unit.

SUMMARY

LOCATION : TA-16
TYPE OF UNIT(s) : OUTFALL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : INACTIVE
PERIOD OF USE : 1940s - 1980s
HAZARDOUS RELEASE : KNOWN
RADIOACTIVE RELEASE : KNOWN

MATERIALS MANAGED : HAZARDOUS WASTE
MIXED WASTE
SOLID WASTE

UNIT INFORMATION

The following table lists inactive outfalls resulting from building drains in TA-16.

SWMU NO.	STRUCTURE NO.	BUILDING DRAIN LOCATION	OUTFALL LOCATION
16-026(a)	TA-16-370	east/south sides	Water Canyon
16-026(b)	TA-16-307	north side	Water Canyon
16-026(c)	TA-16-305	northeast side	Water Canyon
16-026(d)	TA-16-303	south side	Water Canyon
16-026(e)	TA-16-301	south side	Water Canyon
16-026(f)	TA-16-308	northeast/east sides	Valle Canyon
16-026(g)	TA-16-280	northeast side	Valle Canyon
16-026(h)	TA-16-281	northeast side	Valle Canyon
16-026(i)	TA-16-224	northeast/northwest sides	Valle Canyon
16-026(j)	TA-16-226	south/southwest sides	Valle Canyon
16-026(k)	TA-16-221	northeast side	Valle Canyon
16-026(l)	TA-16-220	northeast/southeast/south sides	Valle Canyon
16-026(m)	TA-16-92	east side	Valle Canyon
16-026(n)	TA-16-91	east/southeast sides	Valle Canyon
16-026(o)	TA-16-90	northeast side	Valle Canyon
16-026(p)	TA-16-89	southeast/northeast sides	Valle Canyon
16-026(q)	TA-16-27	north/south sides	Valle Canyon
16-026(r)	TA-16-180	south side	Valle Canyon
16-026(s)	TA-16-5	northeast side	unknown
16-026(t)	TA-16-207	east side	Water Canyon
16-026(u)	TA-16-195	southeast side	Valle Canyon
16-026(v)	TA-16-460	EPA05A072	Water Canyon
16-026(w)	TA-16-45	unknown	Water Canyon
16-026(x)	TA-16-437	south side	Water Canyon
16-026(y)	TA-16-411	east side	Water Canyon
16-026(z)	TA-16-306	south side	Water Canyon
16-026(a2)	TA-16-200	southeast side	Valle Canyon
16-026(b2)	TA-16-202	northeast side	Water Canyon
16-026(c2)	TA-16-462	southeast side	Water Canyon
16-026(d2)	TA-16-435	northeast side	Water Canyon
16-026(e2)	TA-16-415	north side	Water Canyon
16-026(f2)	TA-16-413	north side	Water Canyon
16-026(g2)	TA-16-285	southeast side	Valle Canyon
16-026(h2)	TA-16-360	west/east/north/south sides	Water Canyon
16-026(i2)	TA-16-54	unknown	Valle Canyon
16-026(j2)	TA-16-345	north side	Water Canyon
16-026(k2)	TA-16-260	north/south sides	Water Canyon

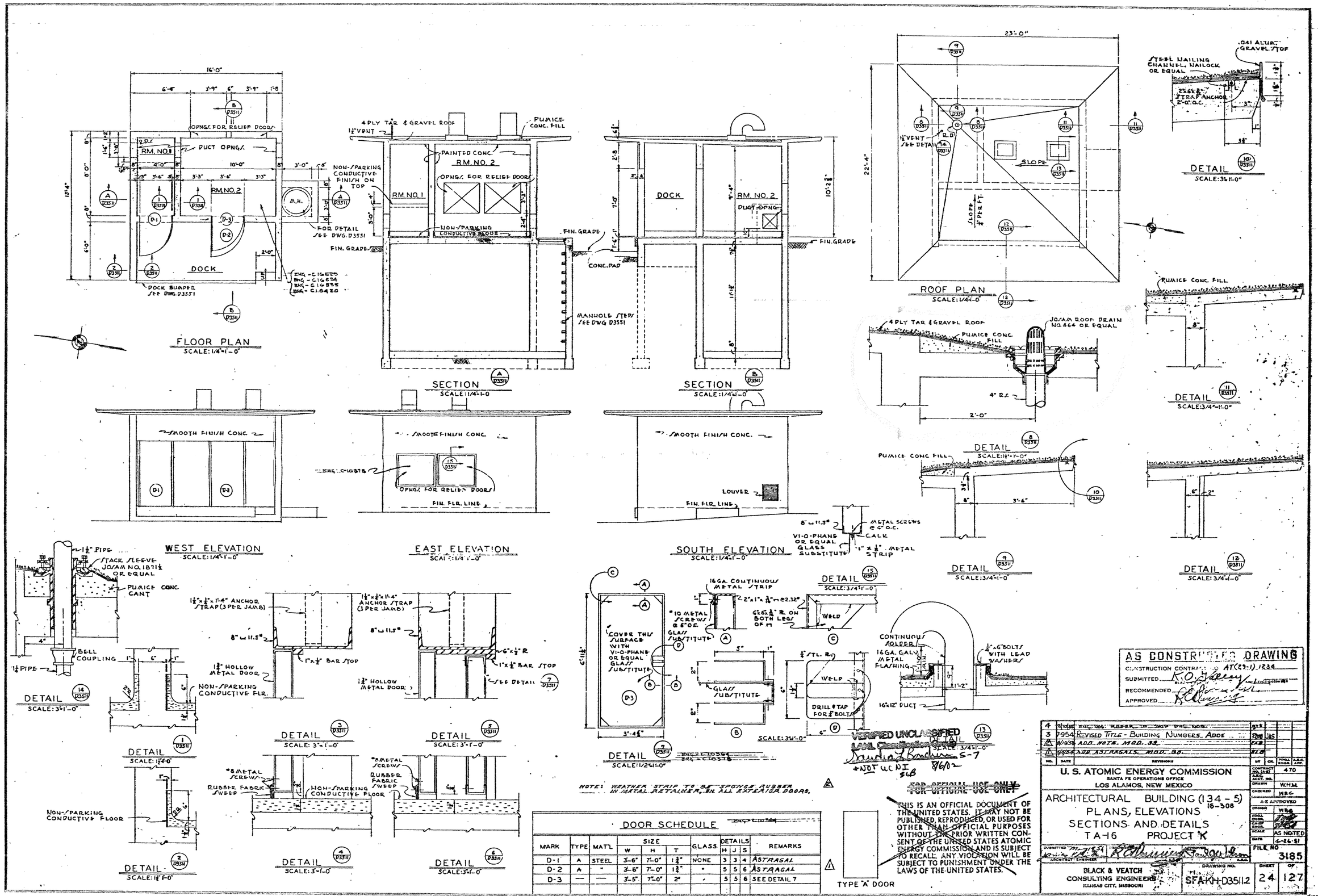
(continued)

LANL Structure History Book: TA-16

Attachment F

16-026

STRUCTURE NUMBER	DESIGNATION AND TITLE	GROUP ASSIGN.	DATE ASSIGN.	GENERAL INFORMATION	J.O. E.S.	NUMBERS
TA-16-305	16-305 Rest House (134-C)		5/11/55	Proposed ☐ Requested by: _____ (Name & Group) Built: On Contract AT(29-1)-1234, Contractor: R. E. McKee, Started 8/10/51, completed 11/23/53. Cost: $97,533.20		670,2337 2408,259 3293,355 3609,584
TA-16-306	~~16-306~~ Plastics (134-4)		5/11/55	Proposed ☐ Requested by: _____ (Name & Group) Built: Same as above. Cost: $813,669.01		670,1284 1479,165 1696,202 2714,276 2832,329 3487,355 & 4622
TA-16-307	16-307 Rest House (134-D) Storage		5/11/55	Proposed ☐ Requested by: _____ (Name & Group) Built: Same as above. Cost: $97,553.20		670,2086 2408,286 3293,355 6260,641
TA-16-308	16-308 ~~Process~~ Building (134-5) (FORMERLY DRYING BUILDING)		5/11/55	Proposed ☐ Requested by: _____ (Name & Group) Built: Same as above. Cost: $26,910.59		670



DOOR SCHEDULE

MARK	TYPE	MAT'L	SIZE W	SIZE H	SIZE T	GLASS	DETAILS H	DETAILS J	DETAILS S	REMARKS
D-1	A	STEEL	3'-6"	7'-0"	1¾"	NONE	3	3	4	ASTRAGAL
D-2	A	"	3'-6"	7'-0"	1¾"	"	5	5	6	ASTRAGAL
D-3	—	—	3'-5"	7'-0"	2"	"	5	5	6	SEE DETAIL 7

Attachment H

5683-D

16-026(F)

Attachment I

16-026 (f)

E/ER MEMO TO FILE

DATE: August 21, 2000

FROM: Linda Nonno, Regulatory Compliance Focus Area

SUBJECT: Personal and telephone interviews regarding HE rest houses at TA-16

BACKGROUND:
In preparation for writing the September 2000 Request for Permit Modification, more information was required to support NFA determinations for PRSs 16-026(d2, e2, f2, g2, h, k, x) and 16-030(b, e, f). Each of these SWMUs is an outfall (and their associated drainlines) that serves a single floor drain in each utility room of ten HE rest houses. A site visit was made to TA-16 on August 15, 2000, and a follow-up visit was made on August 17, 2000. During the August 15 visit, the interior of each utility room was photographed; the TA-16 safety manager, equipment mechanic, and water treatment personnel were interviewed as to procedures, and an attempt was made to locate and photograph each outfall. Only two of the ten outfalls were located on August 15. Ann Sherrard (TA-16's facility management ESH representative) provided Linda Nonno with the temporary use of a copy of a document entitled Wastewater Characterization of Building Drains and Outfalls at S-Site, which was prepared by the staff of Group WX-12 (Engineering and Information Resources) in September 1991. This document (the basis for the Wastewater Stream Characterization conducted by Santa Fe Engineering at TA-16) includes plumbing and drain plans, so a second visit (on August 17) was made to these rest houses in an attempt to locate the other 8 outfalls referenced this document. However, because many of the outfalls are buried, only two additional outfalls were located and photographed during the August 17 visit. The two outfalls located on the August 15 visit and the two located on the August 17 visit were at the exact locations indicated in the plumbing and drain plans provided by Ann Sherrard.

PERSONAL INTERVIEW WITH BILL McCORMICK
August 15, 2000
Interview conducted by Linda Nonno

Mr. McCormick stated that the plastic buckets used to collect steam condensate in the utility rooms are not emptied, but allowed to evaporate. He said the buildings are checked regularly, at least once a week, and some are checked daily. The equipment is serviced regularly by the resident mechanic for TA-16, Steve Santistevan (see Santistevan interview, page 3 of this memo). Other contacts for these buildings include building managers Leonard Maez (667-1832) and Jim Nuttal (667-4975).

Mr. McCormick stated that it was his experience that the equipment in the rest house utility rooms does not leak. However, if a lubricating oil leak were encountered, it would be immediately reported to the facility coordinator who would take action as required. Often, an absorbent pig is placed around equipment for containment. He further stated that he has been at TA-16 since 1981, and in those 19 years, no equipment leak has occurred other than the typical oil drips incurred during day to day operation (hence, the use of pigs).

When asked about why some drains had been unplugged, Mr. McCormick replied that it was done as a precautionary safety measure to prevent the possibility of moisture getting into electrical equipment and causing a short.

When asked if anything was added to the condensate, Mr. McCormick stated that he didn't know but that I should talk to Bill Van Gundy with JCI, Albuquerque, (949-0299) who treats the water at the current TA-16 steam plant (see Van Gundy interview, page 4 of this memo).

Mr. McCormick can be reached at 667-6316 or by pager at 104-6704.

Linda Nonno
August 15, 2000

PERSONAL INTERVIEW WITH STEVE SANTISTEVAN
August 15, 2000
Interview conducted by Linda Nonno

When asked about the quantity and type of oil used in servicing the equipment at the TA-16 rest houses, Mr. Santistevan stated that 20-weight lubricating oil was used. He said the steam pumps required no oil, only the compressors. He went on to say that the compressors were small and had a capacity of ½ quart or less of lubricating oil.

Mr. Santistevan can be reached at 665-0579.

Linda Nonno
August 15, 2000

PERSONAL INTERVIEW WITH BILL VAN GUNDY
August 15, 2000
Interview conducted by Linda Nonno

When asked if anything was added to the steam for the TA-16 rest houses, Mr. Van Gundy stated that he used additives to prevent corrosion and mineral build up in the boilers at the steam plant, but that he didn't know if anything was added to the steam. He has been the boiler operator at the TA-16 steam plant for two years only, and had no idea what was done prior to the time he started working at TA-16. He suggested Jerome Gonzales (665-2612) would probably be able to answer these questions (see Gonzales interview, page 5 of this memo).

Additives include the solutions listed on the attached sheet.

NOTE FROM LN: The TA-16 steam plant is located outside TA-16's gated and fenced HE exclusion area approximately ½ to ¾ of a mile from the nearest of the 10 rest houses, which are all located inside of TA-16's HE exclusion area.

Mr. Van Gundy can be reached at 949-0299.

Linda Nonno
August 15, 2000

TELEPHONE INTERVIEW WITH JEROME GONZALES
August 21, 2000
Interview conducted by Linda Nonno

Jerome Gonzales is the Gas and Steam Engineer for the LANL Utilities Group.

When asked if anything was added to the steam for the TA-16 rest houses, Mr. Gonzales stated that from the time that the new steam plant went into operation in January 1997, nothing has been added to the steam used to heat the buildings at TA-16. Prior to January 1997, amines (an ammonia derivative for corrosion protection) were added to the steam heating all TA-16 buildings.

When asked if it was the Laboratory's practice to use amines at the beginning of TA-16's use of steam as a heating system (in the early 1950s), Mr. Gonzales did not know. However, he did state that since corrosive water treatment technologies had changed little over the past 50 or so years, there was no reason to assume that a different water treatment practice was used by the Laboratory during the 1950s. He suggested I call Joe Ortiz, a water treatment specialist employed by JCI (see Ortiz interview, page 6 of this memo).

NOTE FROM LN: According to Mr. Gonzales amine was added to the steam pipe after the steam exited the steam plant. The amine was injected into the steam pipe in liquid form and immediately vaporized as it came into contact with the steam.

Mr. Gonzales can be reached at 665-2612.

Linda Nonno
August 21, 2000

TELEPHONE INTERVIEW WITH JOE ORTIZ
August 21, 2000
Interview conducted by Linda Nonno

Joe Ortiz is the Water Treatment Specialist for JCI.

Mr. Ortiz re-confirmed everything stated by Mr. Gonzales. He further explained that amines are added to water to control its pH content, which, in turn, prevents corrosion. He said that he would send me a copy (attached) of the materials safety data sheet on this product. Mr. Ortiz reiterated that since corrosive water treatment technologies had changed little over the past years, there was no reason to assume that a different water treatment practice was used by the Laboratory during the 1950s.

Mr. Ortiz can be reached at 667-4842.

Linda Nonno
August 21, 2000

GARRATT-CALLAHAN COMPANY
111 ROLLINS ROAD
MILLBRAE, CALIFORNIA 94030

0405019

FOR MEDICAL EMERGENCY CALL (415) 697-5811, IF NO ANSWER CALL (303) 623-5716 (ROCKY MTN POISON CENTER) 24 HOUR NUMBER.

FORMULA 44

CURRENT AS OF 02/02/1993

SECTION #1 - IDENTIFICATION (LA IDENTIFICACION)

FORMULA 44

SARA Hazard Class:
Acute Health Hazard
Fire Hazard

SARA Hazard Class: Acute Health Hazard

SECTION #2 - HAZARDOUS COMPONENTS (LOS COMPONENTES PELIGROSOS)

COMPONENT: N,N, Diethylaminoethanol
CAS NUMBER: 100-37-8
PERCENT IN MIXTURE: 10-15
ACGIH TLV: 10ppm
OSHA PEL-TWA: 10 ppm

Cyclohexylamine
CAS NUMBER: 108-91-8
PERCENT IN MIXTURE: 25
ACGIH TLV: 10ppm
OSHA PEL-TWA: 10 ppm
TPQ: 10000 Lbs.
RQ: 1 LB.

NOTE: OSHA requires only that hazardous components be listed in this section.

SECTION #3 - PHYSICAL DATA (LA INFORMACION FISICA)

BOILING POINT: 200 F
VAPOR PRESSURE: UNKNOWN
VAPOR DENSITY (AIR=1): UNKNOWN
SPECIFIC GRAVITY: 0.99
SOLUBILITY (H2O): COMPLETE
PERCENT VOLATILES: 100
EVAPORATION RATE: <1 WHERE BUTYL ACETATE = 1
PH FACTOR OF: UNKNOWN
APPEARANCE: CLEAR LIQUID
ODOR: AMMONIA

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SECTION #4 - FIRE & EXPLOSION DATA (LA INFORMACION DE FUEGO Y EXPLOSION)

Flash Point: NONE
Autoignition: NONE
Flammability Class: NONE
Lower explosive limit (%): UNKNOWN
Upper explosive limit (%): UNKNOWN

Extinguishing Media:
Any media may be used.

Fire and Explosion Hazards:
No Special Hazards

Special Fire Fighting Instructions:
Heated product will emit ammoniacal fumes. Self contained breathing apparatus may be necessary.

SECTION #5 - EXPOSURE & EFFECT (LA EXPOSICION Y EFECTOS)

Routes of Exposure - Inhalation:
FUMES MAY IRRITATE EYES, THROAT, LUNGS.

First Aid - Inhalation:
Immediately get the person to fresh air. Avoid breathing fumes. Open doors and windows wide. If patient is not breathing, start artificial respiration and call a physician. Call a physician if pain, irritation, breathing problem, or other symptoms persist.

Route of Exposure - Skin:
MAY BE ABSORBED THROUGH SKIN.

First Aid - Skin:
Wash with water. Consult a physician.

Route of Exposure - Eyes:
WILL BURN OR SEVERELY IRRITATE EYES.

First Aid - Eyes:
Flood the eye with lukewarm (not hot) water from a large glass held 2 or 3 inches from the eye, or use an eyewash fountain. Do this for 15 minutes. Have the patient blink as much as possible while flooding the eye. Do not force eyelid open. CALL A PHYSICIAN.

Route of Exposure - Ingestion:
Moderately toxic.

First Aid - Ingestion:
Give water or milk. Induce vomiting. Call a physician.

Health Conditions Aggravated by Exposure:
NONE KNOWN.

SECTION #6 - REACTIVITY & POLYMERIZATION (LA REACTIVIDAD Y POLIMERIZACION)

Hazardous Polymerization:
WILL NOT OCCUR.

Incompatible Materials:
Acids, Oxidizing agents.

Conditions to avoid (polymerization):
NONE

Conditions to Avoid (stability):
NONE

Hazardous Decomposition Products:
Ammonia, oxides of nitrogen.

Stability: STABLE

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FOR MEDICAL EMERGENCY CALL (415) 697-5811, IF NO ANSWER CALL (303) 623-5716 (ROCKY MTN POISON CENTER) 24 HOUR NUMBER.

SECTION #7 - SPILL, LEAK & DISPOSAL PROCEDURES (LA ATILLA, GOTERA, & LOS PROCEDIMIENTOS DE ELIMACION)

Ventilate area. Small spills of one gallon or less may be flushed to drain with large amounts of water. For larger spills, contain with absorbent material and place in plastic bags.

Dispose of in waste management facility or in compliance with federal, state and local regulations. If spill is not contaminated you may be able to dispose of materials where normally used.

Storage and Handling Conditions
Keep container covered and sealed when not in use. Store in a cool, dry area. Do not add water or any other material to drum of product or otherwise contaminate it.

SECTION #8 - SPECIAL PROTECTIVE MEASURES (LAS MEDIDAS PROTECTORAS ESPECIALES)

Ventilation
NORMAL ROOM VENTILATION

Skin Protection
PLASTIC OR RUBBER GLOVES. ELBOW LENGTH SUGGESTED.

Other Protection:
Rubber boots and apron. Plastic coveralls to prevent skin contact.

Eye Protection:
CHEMICAL WORKER'S GOGGLES OR FACE MASK.

Respiratory Protection:
Self-contained breathing apparatus if exposure is for longer than 15 minutes.

Work/Hygienic Practices:
Have eyewash and safety shower in work area. Remove contaminated clothing. Wash contaminated clothing before reuse. If liquid is absorbed into shoes or gloves, discard.

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THIS HAZARD RATING HAS BEEN DEVELOPED BY GARRATT-CALLAHAN COMPANY AND IS BASED ON NFPA AND HMIS HAZARD CODES. TO ALL INTENTS AND PURPOSES THE GARRATT-CALLAHAN HAZARD RATING AND NFPA/HMIS HAZARD CODES CAN BE ASSUMED TO BE SIMILAR.

View A ains By TA-BLDG

TA-BLDG 16-0308

Date: 5/29/2002

FMU # 70 **WSC Rpt. #** 02

Facility Manager CARATHERS DENNIS L **Bldg. Manager** MARTINEZ, HUMBERTO

Phone 7-8439 **Phone**

EPA OUTFALL #	OPN #	Drain #	Room #	Sources	WSC Recommendation	Corrective Action	Assigned to	Verified?
UNKNOWN	16-0308-OPN-001	BFD1	BASEMENT	POTABLE WATER	PIPE TO SS	PLUGGED	FMU70-028	☑
UNKNOWN	16-0308-OPN-001	BFD1	BASEMENT	FIRE SYSTEM DRAIN	PIPE TO SS	PLUGGED	FMU70-028	☑
UNKNOWN	16-0308-OPN-001	BFD1	BASEMENT	CONDENSATE	PIPE TO SS	PLUGGED	FMU70-028	☑
UNKNOWN	16-0308-OPN-001	BFD2	BASEMENT	AIR COMPRESS KO POT	CONTAINERIZE	PLUGGED	FMU70-028	☑
DAYLIGHT	16-0308-OPN-002	RD1	ROOF	STORM WATER	NO CHANGE	N/A	N/A	☐

Attachment J

16-026 (4)

5.0 SWMU 16-030(c)—OUTFALL AND ASSOCIATED DRAINLINE

5.1 Summary

SWMU 16-030(c) consists of three roof-drain outfalls (and associated drainlines) located at Building 16-222, a former HE-processing building at TA-16. The 1990 SWMU report states that the outfalls originate from roof drains, but provides no information as to any constituents (other than rainwater) that the drain systems were suspected of receiving. Archival documentation and site visits demonstrate that none of the roof drain systems have ever managed solid or hazardous wastes or constituents. Therefore, this SWMU is being proposed for NFA under NFA Criterion 2 (the site has never been used for the management of RCRA solid or hazardous wastes and/or constituents).

5.2 Description and Operational History

5.2.1 Site Description

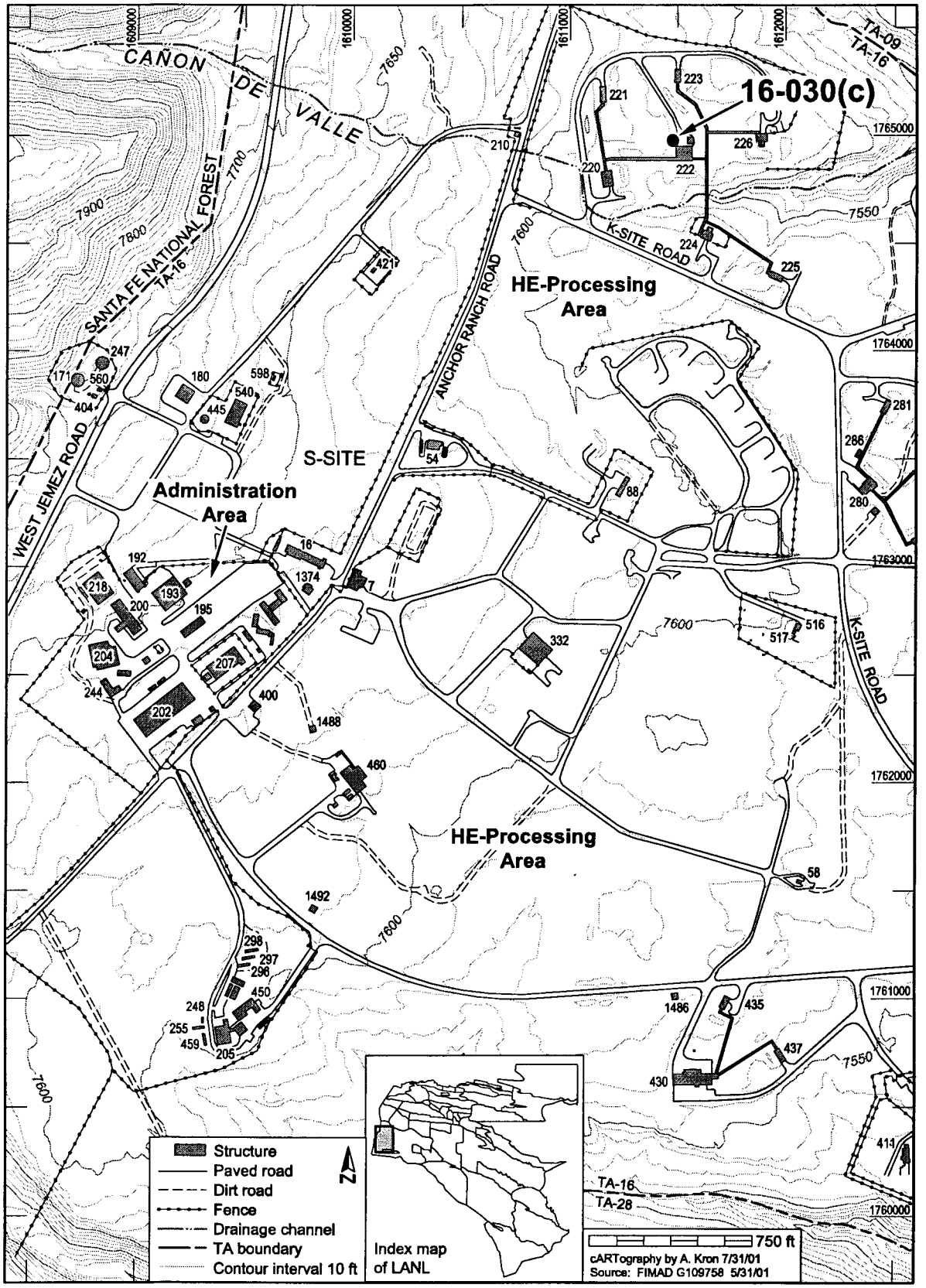
SWMU 16-030(c) consists of three outfalls (and associated drainlines) that originate from four roof drains at Building 16-222, located within the fenced HE-processing area at TA-16 (Figure 5.2-1). The building is an approximately 60- x 70-ft rectangular concrete structure. The single-floor building (i.e., having no basement) consists of approximately 10 rooms of varying size with 2 corridors. (As-built Engineering Drawing ENG-C 15664 [sheet 61 of 121]) (Attachment A).

Building doors are padlocked at all times and, before 2001 (when the building was transferred to the Laboratory's Surveillance and Maintenance Group), building access could be obtained only through a TA-16 access control officer and only with proper approval. Currently, building access is obtained only through Surveillance and Maintenance or decontamination and decommissioning (D&D) personnel.

The 1990 SWMU report describes SWMU 16-030(c) as two outfalls located on the northeast and northwest sides of Building 16-222 (LANL 1990, 07512) (Attachment B). The SWMU report also states that the outfalls from Building 16-222 originate from roof drains, but provides no information as to any constituents (other than rainwater) that the drain systems were suspected of receiving.

In actuality, Building 16-222 has four roof drains which discharge to three outfalls; the roof drains are located at the northeast, northwest, southeast, and southwest corners of the building's roof. Within the interior of the building, the roof drain systems are entirely closed systems. (As-built Engineering Drawings 15664 [sheet 61 of 121] [Attachment A]; 15622 [sheet 19 of 121] [Attachment C]; 15605 [sheet 2 of 121] [Attachment D]; Engineering Location Plan ENG-R 855 [sheet 2 of 38] [Attachment E]; Santa Fe Engineering 1994, 20972 [Attachment F] [**NOTE:** These references also corroborate the roof drain system descriptions that follow.])

- The roof drain at the **northeast corner** of the building exits the northern end of the east wall of the building through a 4-in. cast-iron pipe approximately 4 ft below grade, then connects to a 6-in. vitrified clay pipe (VCP) approximately 5 ft from the building. The VCP continues south to its point of discharge approximately 65 ft southeast of the building. This is the roof drain outfall described in the SWMU report as being located on the northeast side of the building.
- The roof drain on the **northwest corner** of Building 16-222 exits the northern end of the west wall of the building through a 4-in. cast-iron pipe approximately 4 ft below grade, then connects to a 6-in. VCP approximately 5 ft from the building. The VCP continues to its point of discharge approximately 20 ft directly west of the building's northwest corner. This is the roof drain outfall described in the SWMU report as being located on the northwest side of the building.



F5.2-1_PermitMod02/082802/PTM

Figure 5.2-1. Location of SWMU 16-030(c)

- The roof drain on the **southeast corner** of the building exits the eastern end of the south wall of the building through a 4-in. cast-iron pipe approximately 4 ft below grade, then connects to a 6-in. VCP approximately 5 ft south of the building. This VCP is parallel to the building's southern wall and runs west to its point of discharge approximately 15 ft southwest of the building's southwest corner. This roof drain outfall is not mentioned in the SWMU report.
- The roof drain on the **southwest corner** of the building exits the western end of the south wall of the building through a 4-in. cast-iron pipe approximately 4 ft below grade, then (approximately 5 ft south of the building) connects to the same VCP pipe and discharges to the same point of discharge as the southeastern roof drain. This roof drain outfall is not mentioned in the SWMU report.

A May 30, 2002 site visit by RRES-R Program personnel confirmed the information in the engineering drawings (Nonno 2002, 73590) (Attachment G).

SWMUs or AOCs in the proximity of SWMU 16-030(c) are SWMU 16-016(d), a small surface disposal area located approximately 120 ft south of 16-030(c), and SWMU 16-020, an outfall that received untreated, spent photo-fixing solutions located approximately 60 ft south of SWMU 16-026(f).

5.2.2 Operational History

Building 16-222 was constructed in 1951 and became operational in 1952 (LANL ER Records Package 730) (Attachment H). From the time of its construction to the late 1990s, the building was used to x-ray HE weapons components and contained an x-ray film-processing laboratory. The building was not used for approximately three years before undergoing D&D activities, which began during August 2002 and are scheduled to finish in April of 2003. D&D activities will include the demolition and removal of Building 16-222 (including asphalt parking areas and roadways), as well as regrading and revegetating the site. TA-16 facility management will allow the site to revert to its natural state (Attachment G).

The SWMU report (LANL 1990 07512) (Attachment B) provides no information as to the constituents, if any, that these drain systems were suspected of receiving. However, as-built Engineering Drawings ENG-C 15664 (sheet 61 of 121) (Attachment A), ENG-C 15622 (sheet 19 of 121) (Attachment C), and ENG-C 15605 (sheet 2 of 121) (Attachment D) demonstrate that the roof drains were built exclusively to collect and disperse stormwater from the roof of Building 16-222. These drawings also show that within the interior of the building, all three roof-drain systems are entirely closed systems that receive no influent from any other source. These closed systems completely prevent the possibility of the introduction of any foreign substance (such as HE) into the system (Attachment G). The SWMU report statement that the drains received HE and barium was apparently based on the general operational history of TA-16, rather than on a review of the engineering documentation specific to this building. In August of 1995, personnel from the Laboratory's Water Quality and Hydrology Group verified the discharge to daylight of all roof drain systems (Attachment I). In May of 2002, RRES-R Program personnel located two of the three outfalls (Attachment G).

All of the building's remaining drains (floor drains, sink drains, and sanitary fixtures) are tied, as appropriate, to either the sanitary sewer system or to an NPDES outfall that is permitted to receive photographic wastes (NPDES No. 06A073). (As-built Engineering Drawings 15664 [sheet 61 of 121] [Attachment A], 15605 [sheet 2 of 121] [Attachment D], Engineering Location Plan ENG-R 855 [sheet 2 of 38] [Attachment E]; Santa Fe Engineering 1994, 20972 [Attachment F]; Water Quality and Hydrology Group waste stream characterization database [Attachment I]).

5.3 Land Use

5.3.1 Current

TA-16 is an industrial area used for the research, development, processing, and testing of HE. It is a high-security, restricted-access area enclosed by a chain-link fence topped with barbed wire. Access to TA-16 is obtained only by passing through a security guard station. Within this outer fence, a second fence encloses certain HE-processing areas within TA-16. Access through this interior fence is obtained only by passing through a gate secured by a badge-reader. These security measures effectively eliminate the possibility of inadvertent site intrusion.

5.3.2 Future/Proposed

The Laboratory does not anticipate a change from the industrial restricted-access use of TA-16 for the operational life of the Laboratory (LANL 1995, 57224, pp.11–12) (Appendix B, Attachment 1). Future industrial use of this TA will continue to include the research, development, processing, and testing of HE.

5.4 No Further Action Proposal

5.4.1 Rationale

The Laboratory's RRES-R Program is proposing SWMU 16-030(c) for NFA based on the following:

- from the time of their construction to the present, all three roof drain systems and associated outfalls have received the periodic flow of only rainwater from Building 16-222 roof drains;
- within the interior of the building, all three roof drain systems are entirely closed systems that receive no influent from any other source; and
- all other drain systems within the building are tied to appropriate systems.

Thus, based on site visits and archival information, the RRES-R Program has demonstrated that the SWMU 16-030(c) outfalls and associated drainlines have not been used for the management (that is, generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes and/or constituents.

5.4.2 Criterion

Based on the information presented in Sections 5.2 through 5.4 of this proposal, SWMU 16-030(c) is being proposed for NFA under Criterion 2.

5.5 Supporting Documentation Attached

Attachment A: LASL Engineering Drawing ENG-C 15664 (sheet 61 of 121) dated 1951. (LASL 1951, 73484)

Attachment B: Page 16-030 from the SWMU report, Volume II. (LANL 1990, 07512)

Attachment C: LASL Engineering Drawing ENG-C 15622 (sheet 19 of 121) dated 1951. (LASL 1951, 73485)

Attachment D: LASL Engineering Drawing ENG-C 15605 (sheet 2 of 121) dated 1951. (LASL 1951, 73486)

Attachment E: LASL Engineering Location Plan ENG- R 855 (sheet 2 of 38) dated 1959. (LASL 1959, 24165)

Attachment F: Relevant pages from waste stream characterization report for TA-16-222, 1992 update. (Santa Fe Engineering 1992, 20972)

Attachment G: Nonno site visit. (Nonno 2000, 73590)

Attachment H: Relevant page from LANL TA-16 structure history book. (LANL ER Records Package 730)

Attachment I: Printout from Water Quality and Hydrology Group's waste stream characterization database.

Appendix B, Attachment 1: LANL site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

5.6 References Used for Text of the Proposal for Permit Modification

LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1082, Addendum 2," Los Alamos National Laboratory report LA-UR-95-1038, Los Alamos, New Mexico, p. 6-8. (LANL 1995, 57225)

Environmental Restoration Project, September 1998. "Chapter 6 of RFI Work Plan for OU 1082, Addendum 2, Rev.1," Los Alamos National Laboratory, Los Alamos, New Mexico, pp. 6-3 and 6-4. (Environmental Restoration Project 1998, 59685)

5.7 History of Regulatory Deliverables

LANL, July 5, 1995: RFI work plan for OU 1082, Addendum 2, submitted to EPA, Region 6. (LANL 1995, 57225)

LANL, September 11, 1998: Submittal of ecological and ARARs revision of Chapter 6 of the RFI work plan for OU 1082, Addendum 2, to DOE as partial satisfaction of Functional Area A.2 Performance Measure. (LANL 1998, 59685)

NMED, Winter, 1998/1999: NMED verbally requested that the ecological and ARARs revision of Chapter 6 of the RFI work plan for OU 1082, Addendum 2, not be submitted for NMED review because it would be more efficient to make the Chapter 6 NFA proposals via a first-pass Class III permit modification request. (LANL 1998, 59685) (Appendix B, Attachment 2)

At the time that Addendum 2 of the RFI work plan for OU 1082 was submitted for review, NMED had not yet fully developed its five criteria for NFA. The work plan proposed NFA based on four criteria, rather than five, and on human health evaluations only. In 1998, the ER Project evaluated the NFA recommendations made in Addendum 2 of the work plan against ecological risk and other applicable regulations and standards. In conjunction with the DOE, the ER Project wrote a replacement Chapter 6 for this work plan that

- applied the NFA criteria more recently developed by NMED;
- reevaluated the NFA proposals to include an evaluation of ecological risk as well as other applicable regulations and standards; and
- removed NFA proposals that were no longer viable based on the above two bullets.

In the winter of 1998/1999, a verbal agreement was made between Mr. Dave McInroy of the ER Project and Mr. John Kieling of the NMED Hazardous Waste Bureau. Mr. Kieling requested that the text of Chapter 6 of Addendum 2 of the OU 1082 work plan not be significantly modified in 1998, but the revised NFA proposals be submitted in a first-pass Class III request for permit modification (LANL 1998, 59685) (Appendix B, Attachment 2). Therefore, the Laboratory's RRES-R Program is making the NFA proposal for SWMUs 16-030(c) in this proposal for permit modification.

5.7.1 References for Regulatory Deliverables

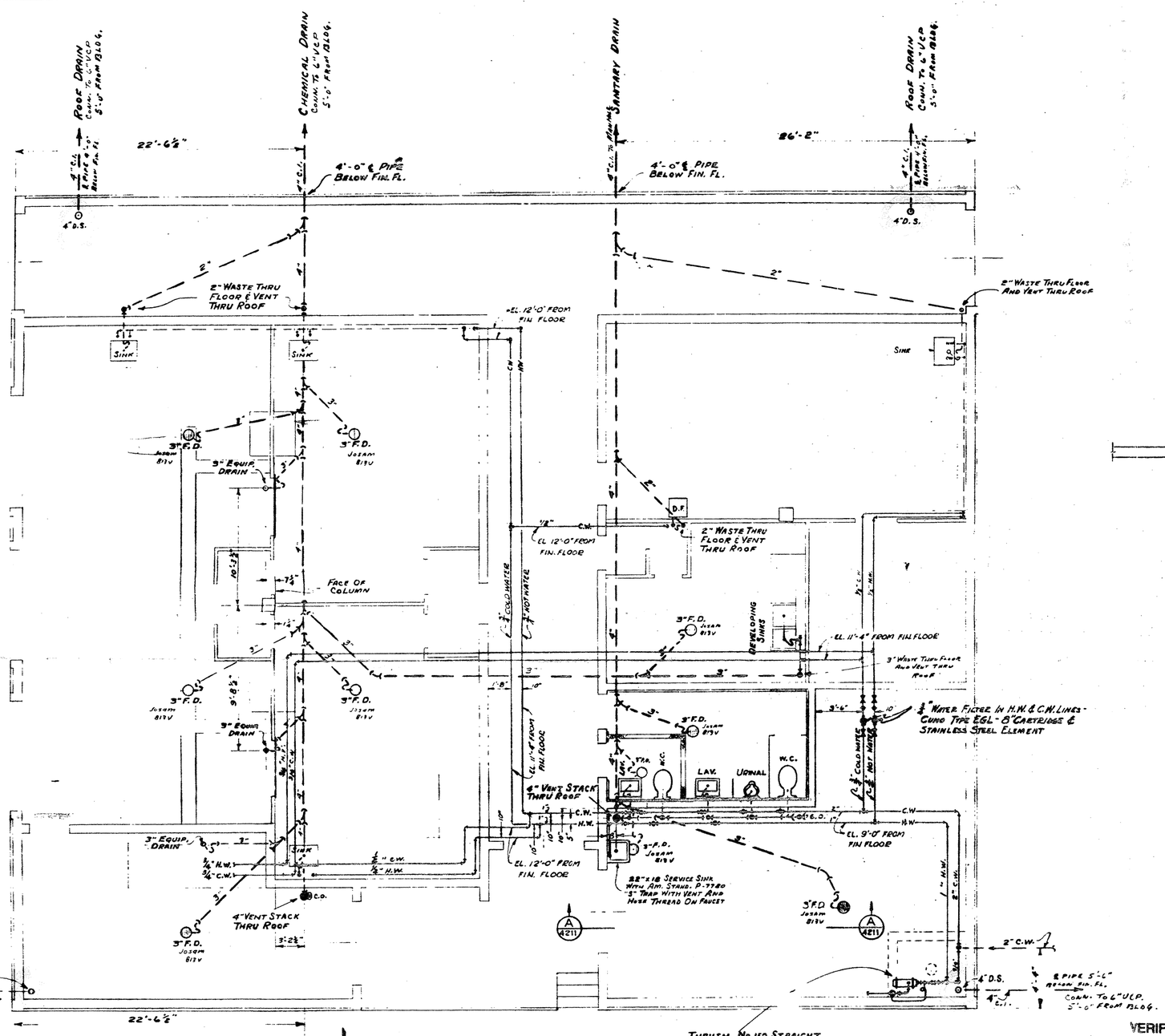
LANL (Los Alamos National Laboratory), July 1995. "RFI Work Plan for Operable Unit 1082, Addendum 2," Los Alamos National Laboratory report LA-UR-95-1038, Los Alamos, New Mexico. (LANL 1995, 57225)

Environmental Restoration Project, September 1998. "Chapter 6 of RFI Work Plan for OU 1082, Addendum 2, Rev. 1," Los Alamos National Laboratory, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 59685)

LANL (Los Alamos National Laboratory), September 11, 1998. "Rewrite of Chapter 6 Within RFI Work Plan for OU 1082 to Satisfy PM for Functional Area A.2," Los Alamos National Laboratory letter to T. Taylor (DOE-LAAO) from J. Canepa (ER Project), Los Alamos, New Mexico. (LANL 1998, 59685)

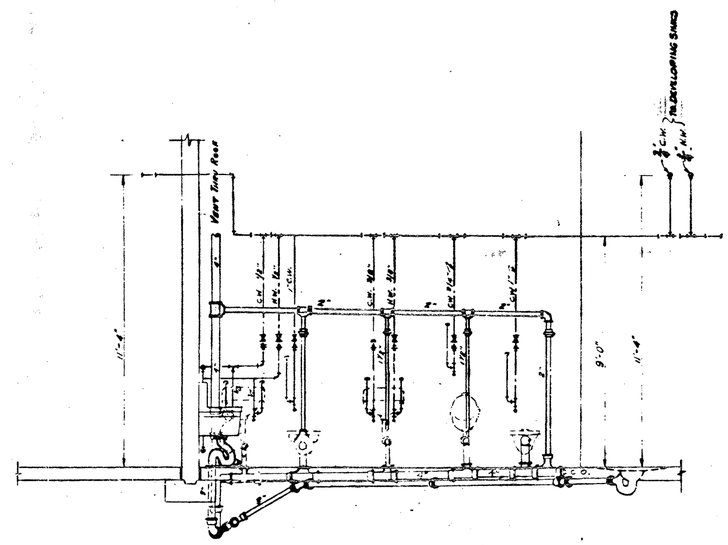
16-030(c)

ATTACHMENTS



PLAN VIEW

SCALE - 1/4" = 1'-0"



SECTION A/4211
SANITARY PLUMBING
3/8" = 1'-0"

GENERAL NOTES

1. MATERIAL OR EQUIVALENT EQUAL TO THAT SPECIFIED WILL BE ACCEPTABLE.
2. ALL SOIL AND WATER LINES UNDER FLOOR SHALL BE EXTRA-HEAVY C.I. SOIL PIPE & FITTINGS.
3. ALL VENTS AND DOWNSPOUTS SHALL BE SCH. 40 GALV. STEEL PIPE & C.I. SCREWED DRAINAGE FITTINGS.
4. ALL WATER PIPING SHALL BE SCH. 40 GALV. STEEL PIPE & GALV. 150 LB. MAL. IRON SCREWED FITTINGS.
5. ALL PLUMBING FIXTURES SHALL BE AS REQUIRED BY THE SPECIFICATIONS TO THIS CONTRACT.
6. ALL DOWNSPOUTS SHALL HAVE TEST TEE CLEANOUT FITTING AT FLOOR.

REFERENCE DWGS.

4261 - Sprinkler layout Bldg.(131-2) 16-222
4311 - Plumbing layout Bldg.(131-3) 16-226 16-225
4251 - Heating and Ventilating layout Bldg.(131-2)
4252 - Utility Room layout & Details Bldg.(131-2) 16-222
7211 - Lighting and power layout " "
2021 - Civil General Layout 131 Group.

VERIFIED UNCLASSIFIED
LANL Classification Group
Sandia X Bonchin 8-7
+NOT UCNI 8/6/02
SCB

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AS CONSTRUCTED DRAWING
CONSTRUCTION CONTRACT NO. AT(29-1) 1208
SUBMITTED K. O. Lawrence
RECOMMENDED
APPROVED

NO.	DATE	REVISIONS	BY	CK.	PROJ. ENGR.	A.E.C. APP.
1	2/15/59	REVISED TITLE	PM			

U. S. ATOMIC ENERGY COMMISSION
SANTA FE OPERATIONS OFFICE
LOS ALAMOS, NEW MEXICO

MECHANICAL
BUILDING (NO. 131-2) 16-222
PLUMBING LAYOUT
TA-16 PROJECT "J"

CONTRACT NO. (A.E.C.) A.E.C. ACCT. NO. 470
DRAWN A.G.
CHECKED
A-E APPROVED
DESIGN
PROJ. ENGR.
CHIEF ENGR.
SCALE AS NOTED
DATE 2/6/57
FILE NO. 2950

SUBMITTED Feb 25, 57 ARCHITECT-ENGINEER
APPROVED
BLACK & VEATCH CONSULTING ENGINEERS KANSAS CITY, MISSOURI
DRAWING NO. SFA-JW-B4211
SHEET 61 OF 121

LAB JOB 669 L.A.S.L. DWG. NO. ENG-C 15664

Attachment A
16-030 (c)

5683-E

SUMMARY

LOCATION : TA-16
TYPE OF UNIT(s) : OUTFALL
UNIT USE : DISPOSAL
OPERATIONAL STATUS : ACTIVE
PERIOD OF USE : ? - PRESENT
HAZARDOUS RELEASE : UNKNOWN
RADIOACTIVE RELEASE : NONE

MATERIALS MANAGED : HAZARDOUS WASTE
SOLID WASTE

UNIT INFORMATION

The following table is a list of active outfalls originating from building drains.

SWMU NO.	STRUCTURE	BUILDING DRAIN LOCATION
16-030(a)	TA-16-344	back wall of building
16-030(b)	TA-16-343	north side
16-030(c)	TA-16-222	northwest side
16-030(c)	TA-16-222	northeast side
16-030(d)	TA-16-280	EPA05A061
16-030(e)	TA-16-225	south side
16-030(f)	TA-16-223	north side
16-030(g)	TA-16-380	south side
16-030(h)	TA-16-430(10)	south side

(10) : number of outfalls

WASTE INFORMATION

TA-16-225, -343, -380, and -223 building drains receive compressor condensate. The outfalls from TA-16-222 originate from roof drains. The building drain in TA-16-344 may receive solvents. The outfall from TA-16-280 contains HE. One outfall from TA-16-430 receives steam condensate. The other outfalls received washwater and treated water.

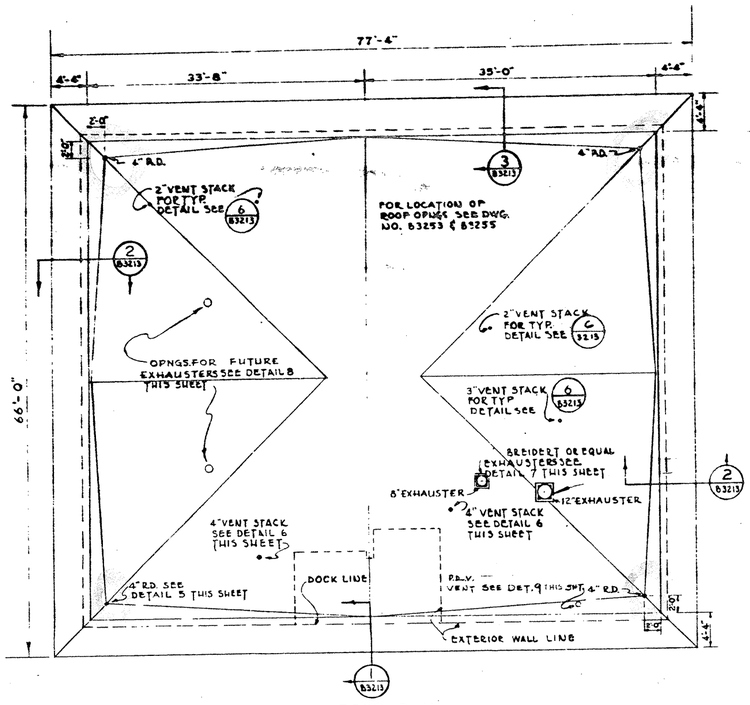
RELEASE INFORMATION

It is unknown whether hazardous waste has been released through the outfalls.

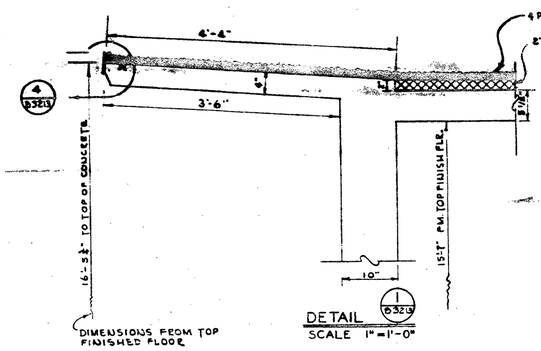
SWMU CROSS-REFERENCE LIST

SWMU NUMBER	CEARP IDENTIFICATION NUMBER(S)	RFA UNIT	E.R. RELEASE SITE INFO.	ASSOCIATED STRUCTURES
16-030(a)	**		Tsk 12 : 66	TA-16-344
16-030(b)	**		Tsk 12 : 72	TA-16-343
16-030(c)	TA16-5-O/CA-A/I-HW/RW		Tsk 12 : 82 83	TA-16-222
16-030(d)	**		Tsk 13 : 210	TA-16-280
16-030(e)	**		Tsk 13 : 213	TA-16-225
16-030(f)	**		Tsk 13 : 218	TA-16-223
16-030(g)	TA16-5-O/CA-A/I-HW/RW			TA-16-380
16-030(h)	TA16-5-O/CA-A/I-HW/RW			TA-16-430

** No corresponding E. R. Program unit.



ROOF PLAN
SCALE 1/8"=1'-0"



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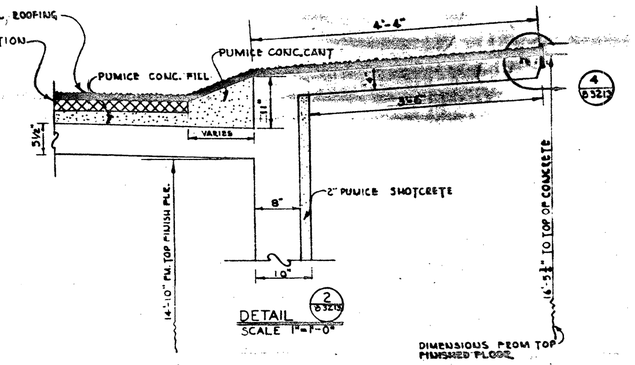

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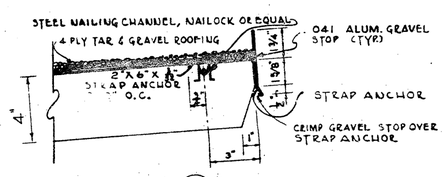

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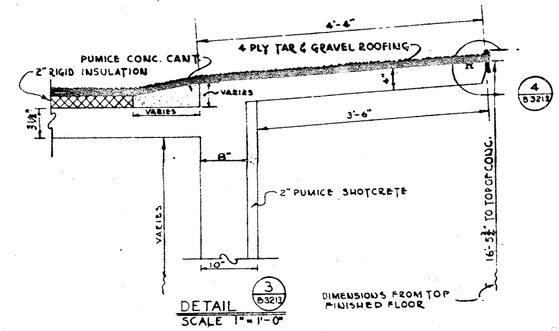

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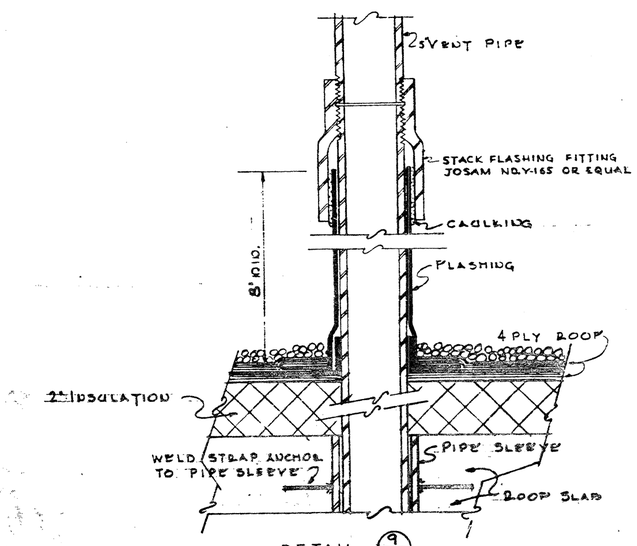
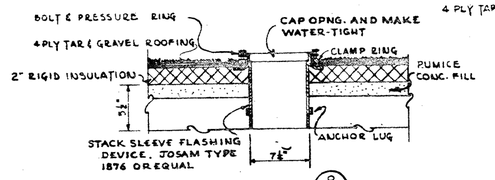


DETAIL
NO SCALE
SEE DWG. NO. 4252



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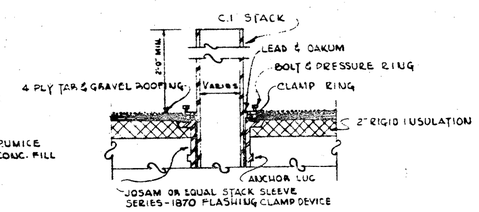

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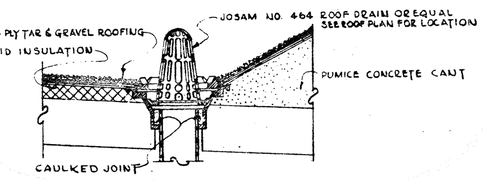

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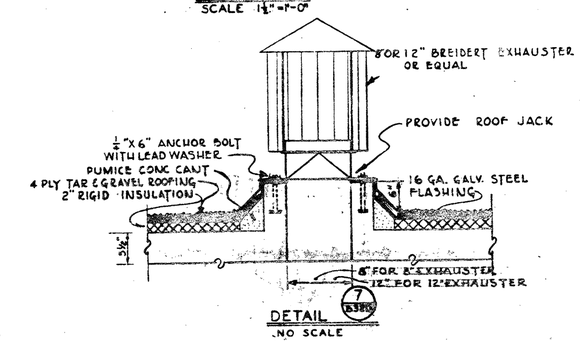

DETAIL
NO SCALE

DRAWING
AT(29-1) 1208
K.O. Gallery

VERIFIED UNCLASSIFIED
LANL Classification Group
Sandra L. Bencline S-7
8/6/02

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NO.	DATE	REVISIONS	BY	CK.	PROJ. ENGR.	A.E.C. APP.
1	7/6/61	REVISED TITLE				

U. S. ATOMIC ENERGY COMMISSION
SANTA FE OPERATIONS OFFICE
LOS ALAMOS, NEW MEXICO

ARCHITECTURAL
BUILDING (NO. 131-2)16-222
ROOF PLAN AND DETAILS
TA-16 PROJECT "J"

CONTRACT NO. AT-(29-1) 470
ACCT. NO.
DRAWN J.O.M.
CHECKED W.E.C.
AS APPROVED
DESIGNED W.E.C.
PROJ. ENGR.
ENGR.
DRAFT.
SCALE AS NOTED
DATE 2-8-61
FILE NO. 2901

ARCHITECT-ENGINEER BLACK & VEATCH CONSULTING ENGINEERS KANSAS CITY, MISSOURI
DRAWING NO. SFA-JW-B3213
SHEET 19 OF 121

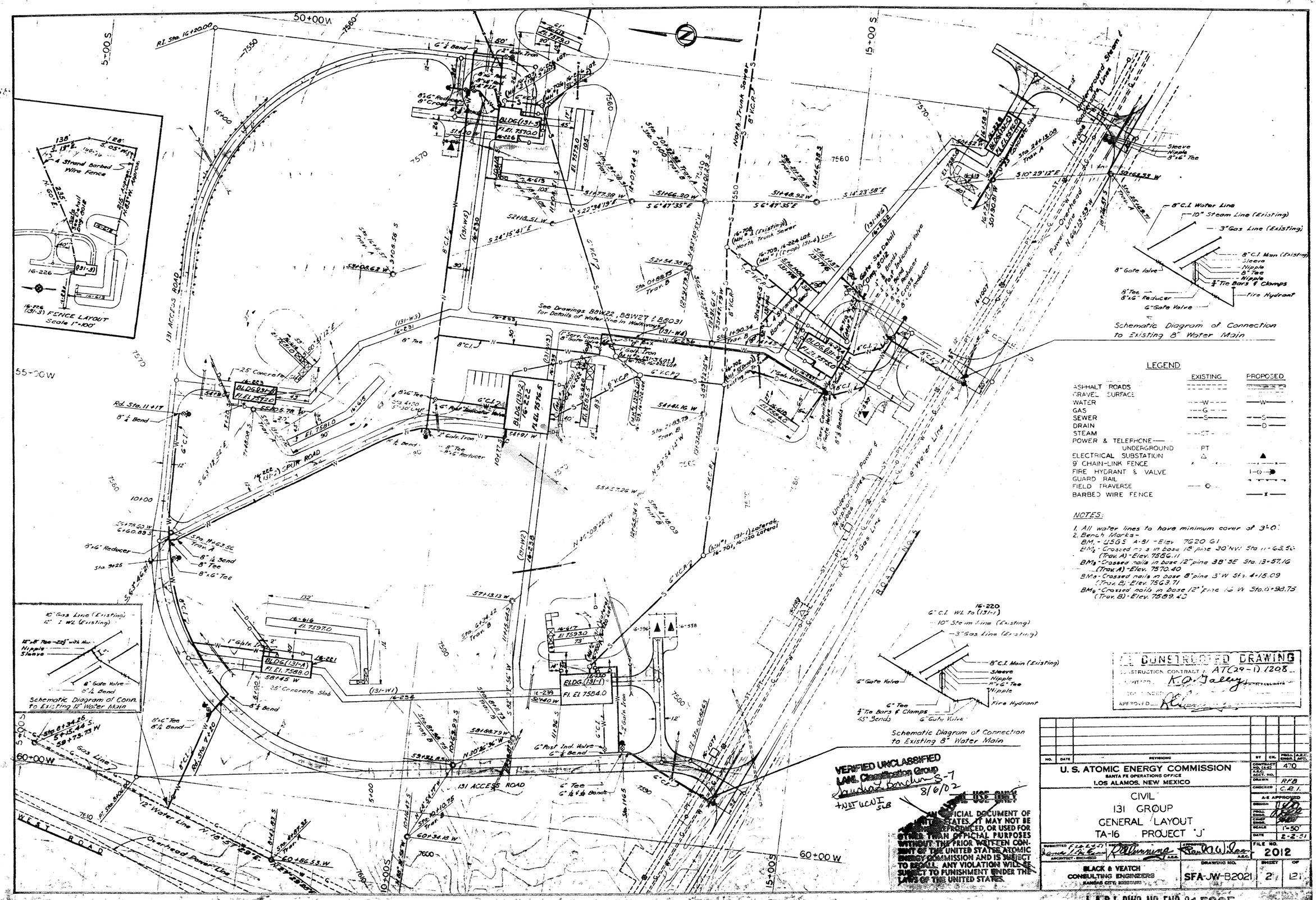
LAB JOB 669

L.A.S.L. DWG. NO. ENG-C 15622

Attachment C

5683-F

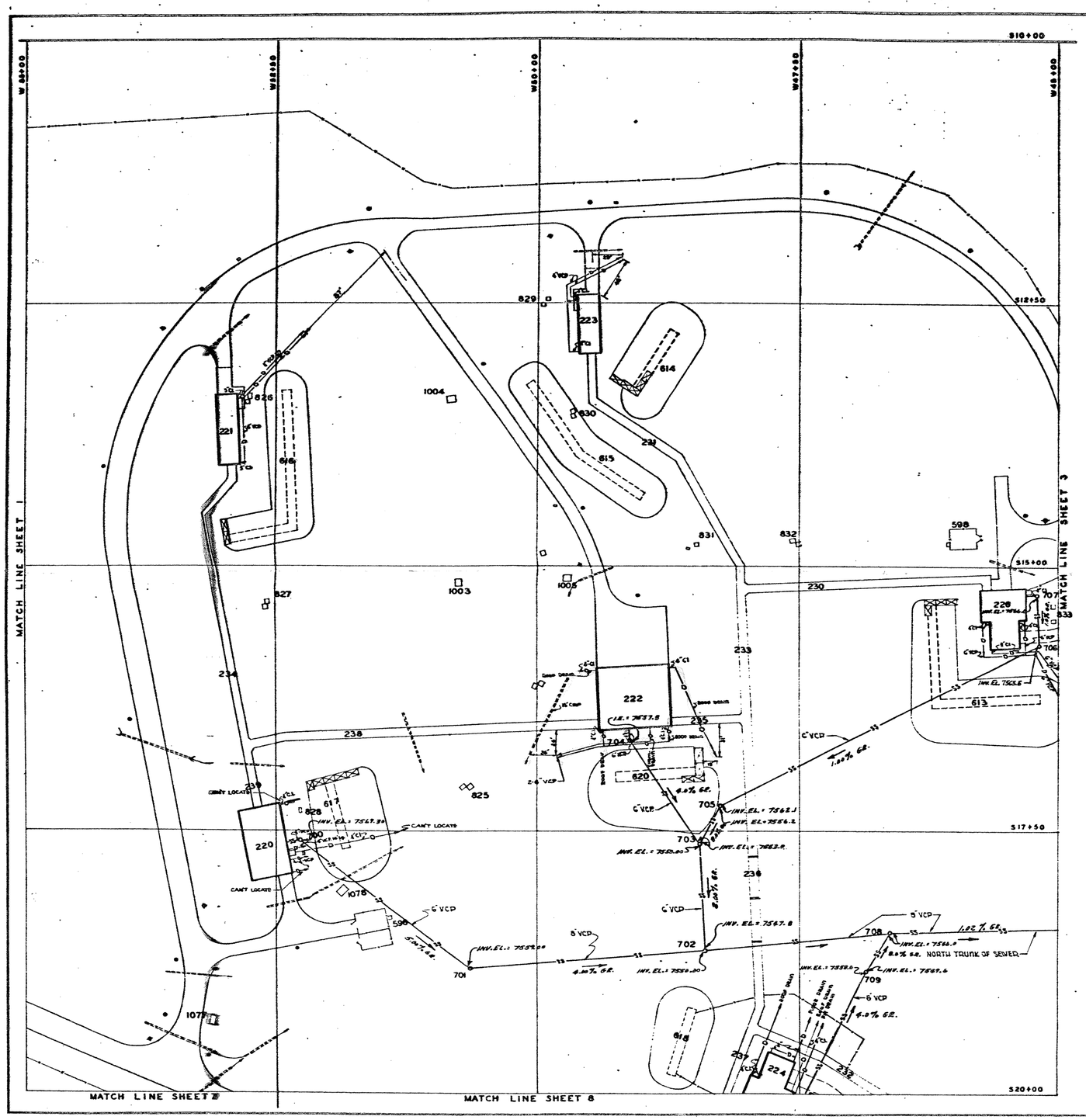
16-030(c)



5683-G

Attachment D

16-030(G)



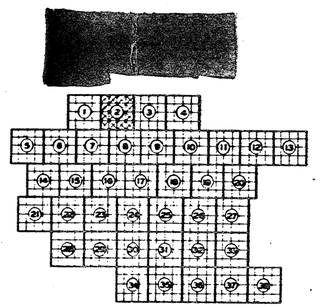
LEGEND

—SS— SANITARY SEWER
—D— DRAIN LINE

REFERENCE DWGS.

ENG-C-15606 PROJECT J - GROUP IM
" " 15605 " " " "
" " 15711 " " " "
" " 11655 PROJECT C
ENG-R 155

Classification changed to UNCLASSIFIED
by authority of the U. S. Atomic Energy Commission.
For R.D. KROHN 4-19-61
(Person authorizing change in classification) (Date)
By [signature] 4-19-61
(Signature of person making the change, and date)



INDEX TO SHEETS
NO SCALE

NO.	DATE	REVISIONS	BY	CHKD	GRP LDR	ENG D. O.

AUTHORIZED FOR: HEALTH, SAFETY, FIRE PROT., SEC.

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
ENGINEERING DEPARTMENT — LOS ALAMOS, N. M.

UTILITY LOCATION PLAN
TA-16 S-SITE
SEWER SYSTEMS

CHECKED	RECOMMENDED	APPROVED
BPW DESIGNER	SEP GROUP LEADER	GB ENG. DEPT. OFFICE

DRAWN	DATE	DRAWING NO.
McCOMB - T.R. J	3-1-59	ENG-R 855
SCALE 1 IN. = 50 FT.	SHEET 2 OF 38	

INFORMATION SHOWN
CURRENT AS OF 6-59

LAB. JOB NO. 337

5683-H

Los Alamos Environmental Restoration Records Processing Facility
ER Record I.D.# 0024165

Attachment E
16-030(c)

20912

Attachment F

16-030(c)

WASTEWATER STREAM CHARACTERIZATION FOR TA 16-220, 221, 222, 223, 224, 225, 226, 230, 231, 232, 233, 234, 235, 236, 237, 238 AND 239

at
Los Alamos National Laboratory

ENVIRONMENTAL STUDY

CHARACTERIZATION REPORT #7

ENVIRONMENTAL MANAGEMENT DIVISION
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Los Alamos National Laboratory is operated by the University of California for the United States Department of Energy

condensate drum vent. These outfalls should be included in an NOI.

4.2 Outfall 16-221-OPN-3

This outfall receives water from roof drains RD1 and RD2. The final destination of the water discharged is not presently known. The flow from this outfall is intermittent and will consist of storm water. Locating the destination or repiping this outfall is recommended. No permitting is recommended.

4.3 Outfall 16-221-OPN-4

This outfall is from a below-grade utility valve box that has a drain (SPD1) in the bottom. The destination of the outfall is not known with certainty. Flow probably is leaching into the sand beneath the pit. This outfall should be included in an NOI. No piping changes are recommended.

5.0 RECOMMENDATIONS FOR BUILDING 222

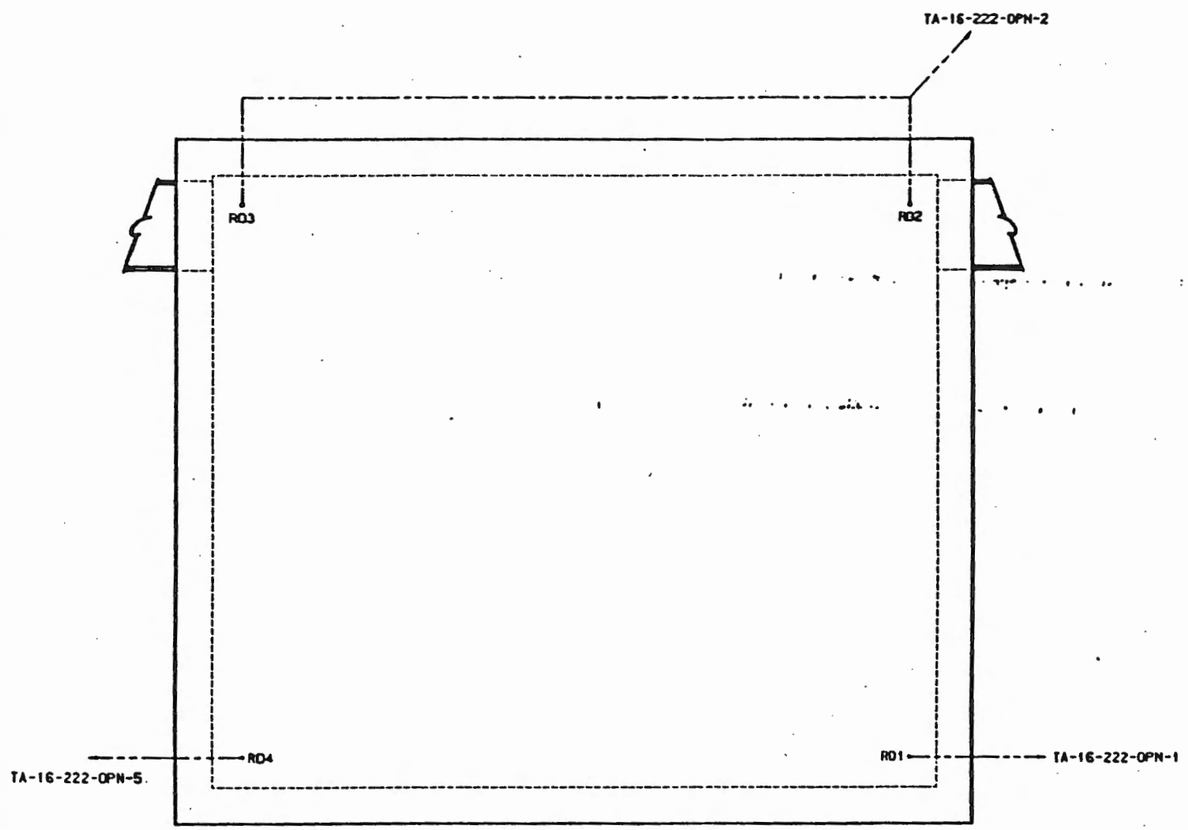
Table 4 is a list of the drains to the building outfalls and Figure 4 is a schematic of the piping. The table lists the drains that connect to each outfall pipe and includes recommendations for changes to the drain piping. The discussion below gives the reasoning for the recommendations.

5.1 Outfalls 16-222-OPN-1, 16-222-OPN-2 and 16-222-OPN-5

These outfalls receive water from roof drains RD1, RD2, RD3 and RD4. The final destination of the water discharged through these pipes is not presently known. Locating the destination or repiping these outfalls is recommended. No permitting is recommended and no EPA forms were completed.

UNCLASSIFIED

PART OR CONTROL NUMBER	ISS	CLASS REVIEW	REVISIONS DESCRIPTION
NA	A	JH	DRAWN BY - VISEL 6-11-91 CHECKER - ABERCROMBIE ENGINEER - DON PALMER APPROVED - PALMER



ROOF DRAIN PLAN
SCALE: 3/16"=1'

LEGEND
RD#------RAIN DRAIN #

PART CODE	LOS ALAMOS NATIONAL LABORATORY	
SHEET 3 / ISSUE A	TITLE (U) TITLE CLASSIFICATION	ROOF DRAIN PLAN TA-16-222
PART CLASSIFICATION UNCLASSIFIED		
ENGLISH (FT/IN)	DRAWING CLASSIFICATION UNCLASSIFIED	SIZE D / DRAWING NUMBER 13Y-192105
THIRD ANGLE PROJECTION	06-26-91 08:38	FSCM 89516 / SCALE 1/50 / SHEET 3 OF -
	STATUS	ORIGIN LA-ICEMPLUS-V2.03

UNCLASSIFIED

Attachment G

16-030(c)

E/ER MEMO TO FILE

DATE: June 1, 2002

FROM: Linda Nonno, RRES-R Regulatory Compliance Focus Area

SUBJECT: Site visits to Building 16-222, HE rest house

BACKGROUND:
In preparation for writing the September 2002 Petition for Permit Modification, verification of engineering drawings supporting NFA determinations for SWMU 16-030(c) was required. SWMU 16-030(c) consists of three outfalls (and associated drainlines) located at Building 16-222. Two of the outfalls each serve a single roof drain and the third outfall serves two roof drains. A site visit was made to Building 16-222 on May 30, 2002. A description of that site visit follows .

DESCRIPTION OF SITE VISIT TO BUILDING 16-222, 16-030(c), May 30, 2002

Investigators: Linda Nonno, RRES-R Regulatory Compliance Team, accompanied by Vince Rodriguez, JCI Environment Safety & Health (representing D&D), 667-0104, 699-1037 (cell), 996-0712 (pager)

Within the building, the roof drains are visible and physically located exactly as indicated in the engineering drawings. Each drain system is a closed system, thus preventing the possibility for the intrusion of any foreign element (such as HE) into the system.

Vince and I located two of the three roof drain outfalls for this building. We located the outfalls for the roof drain at the northwest corner of the building (discharging approximately 20 ft west of the building's northwest corner) and for the roof drains at the southeast and southwest corners of the building (discharging to the same outfall located approximately 15 ft southwest of the building's southwest corner). However, we couldn't find the outfall for the roof drain at the northeast corner of the building, which (according to engineering drawings) discharges approximately 65 ft southeast of the building. This may have been because the outfall pipe has been buried since 1995 when ESH-18 personnel located it, or we didn't go quite far enough (i.e, 65 ft) from the building.

I asked Vince to go over the D&D activities planned for this summer. He clarified that the building and all associated structures would be demolished, the earthen berms surrounding the building would be used as fill for the vacant area left by removing the foundation of the building, and all asphalt parking areas (including roadways) would also be removed. Once removal activities are completed, the area will be regraded and revegetated. TA-16 management will allow the site to revert to its natural state.

Linda Nonno 6/1/02

Linda Nonno

LANL Structure History Book - TA-16

Attachment H

16-030(c)

STRUCTURE NUMBER	DESIGNATION AND TITLE	GROUP ASSIGN.	DATE ASSIGN.	GENERAL INFORMATION	W.O. J.O. E.S.	LAB JOB NUMBERS
TA-16-221	16-221 Rest House (131-A)		11/2/53	Proposed ☐ Requested by: _____ (Name & Group) Built: On Contract AT(29-1)-1208, Contractor: R. E. McKee, started 6/14/51 completed 7/9/52. Cost: $38,617.97		669,1275
TA-16-222	16-222 Dark Room Bldg. (131-2)		11/2/53	Proposed ☐ Requested by: _____ (Name & Group) Built: Same as above. Cost: $176,159.00		669
TA-16-223	16-223 Rest House (131-B)		11/2/53	Proposed ☐ Requested by: _____ (Name & Group) Built: Same as above. Cost: $36,188.96		669,127
TA-16-224	16-224 X-Ray Building (131-4)		11/2/53	Proposed ☐ Requested by: _____ (Name & Group) Built: Same as above. Cost: $37,223.96		669,127. & 2782

View A... Drains By TA-BLDG

TA-BLDG 16-0222

Date: 5/29/2002

FMU # 70 WSC Rpt. # 07

Facility Manager CARATHERS DENNIS L Bldg. Manager FRESQUEZ, STEVE

Phone 7-8439 Phone

EPA OUTFALL #	OPN #	Drain #	Room #	Sources	WSC Recommendation	Corrective Action	Assigned to	Verified?
DAYLIGHT	16-0222-OPN-001	RD1		STORM WATER	VERIFY	VERIFIED	FM	✔
DAYLIGHT	16-0222-OPN-002	RD2		STORM WATER	VERIFY	VERIFIED	FM	✔
DAYLIGHT	16-0222-OPN-002	RD3		STORM WATER	VERIFY	VERIFIED	FM	✔
06A073	16-0222-OPN-003	1EQD1	104	EQUIPMENT DRAIN	MODIFY	UNPLUGGED/REROUTE TO	FSS70-007	✔
06A073	16-0222-OPN-003	1FD05	106	NONE	NO CHANGE	PLUGGED	FSS70-007	✔
06A073	16-0222-OPN-003	1FD06	102	PHOTO RINSE	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1FD07	101	FLOOR WASHINGS	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1FD08	101	FLOOR WASHINGS	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1FD09	101	FLOOR WASHINGS	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1FD10	103	PHOTO RINSE	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1FD11	101	FLOOR WASHINGS	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1FD12	104	FLOOR WASHINGS	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1SD2	106	SINK	PIPE TO SS	REMOVED	FSS70-007	✔
06A073	16-0222-OPN-003	1SD4	102	PHOTO RINSE	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1SD5	101	PHOTO RINSE	NO CHANGE	REROUTED TO SS	N/A	☐
06A073	16-0222-OPN-003	1SD6	103	PHOTO RINSE	NO CHANGE	REROUTED TO SS	N/A	☐
03S/SWSC	16-0222-OPN-004	1FD01	110	CHILLER WATER	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1FD02	110	FLOOR WASHINGS	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1FD03	109	FLOOR WASHINGS	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1FD04	108	FLOOR WASHINGS	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1LV1	108	SANITARY WASTE	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1LV2	109	HAND WASHING	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1SD1	110	SINK	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1T1	108	SANITARY WASTE	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1T2	109	SANITARY WASTE	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1UR1	108	SANITARY WASTE	NO CHANGE	N/A	N/A	☐
03S/SWSC	16-0222-OPN-004	1WF1	104	DRINKING WATER	NO CHANGE	N/A	N/A	☐
UNKNOWN	16-0222-OPN-005	RD4		STORM WATER	VERIFY	VERIFIED	FM	✔
STEAM PIT	16-0222-OPN-006	SPD1	110	STEAM CONDENSATE	MODIFY	NOI	ESH-18	☐
DAYLIGHT	16-0222-OPN-007	N/A	110	STEAM CONDENSATE	NOI	NOI	ESH-18	☐
DAYLIGHT	16-0222-OPN-008	N/A	110	STEAM CONDENSATE	NOI	NOI	ESH-18	☐
DAYLIGHT	16-0222-OPN-009	N/A	110	STEAM CONDENSATE	NOI	NOI	ESH-18	☐
DAYLIGHT	16-0222-OPN-010	N/A	110	STEAM CONDENSATE	NOI	NOI	ESH-18	☐
DAYLIGHT	16-0222-OPN-011	N/A	110	FIRE SYSTEM DRAIN	NOI	NOI	ESH-18	✔

Attachment I

16-030(c)

6.0 SWMU 73-004(c)—SEPTIC SYSTEM

6.1 Summary

SWMU 73-004(c) is a septic system that served the former terminal building at the Los Alamos Airport. The terminal building, built during the early 1950s, was served by the septic tank until the terminal building was connected to a sanitary sewer system. The building was removed between 1970 and 1971 and replaced with the terminal building currently in use at the airport. The investigating field team was unable to locate the septic system by probing with a steel rod, by digging trenches in the area, or by conducting a visual inspection of the canyon rim. An electromagnetic geophysical survey conducted in 1997 indicates that the septic system has been removed. SWMU 73-004(c) is being proposed for NFA under NFA Criterion 1 (the site cannot be located).

6.2 Description and Operational History

6.2.1 Site Description

The SWMU report identified SWMU 73-004(c) as a septic system associated with and located north of the Los Alamos Airport control tower. The report also states that the septic tank is believed to have handled sanitary waste only. The control "tower" was a room contained within the former Los Alamos Airport terminal building, which was located approximately 75 ft due east of the existing terminal (Figure 6.2-1; ENG-C 39948 [sheet 2 of 9] [Attachment A]).

The original terminal building was a wooden, shingle-covered structure that contained a small waiting room, a glass-enclosed air-traffic-control room, and two restrooms (Nonno 2002, 73452) (Attachment B).

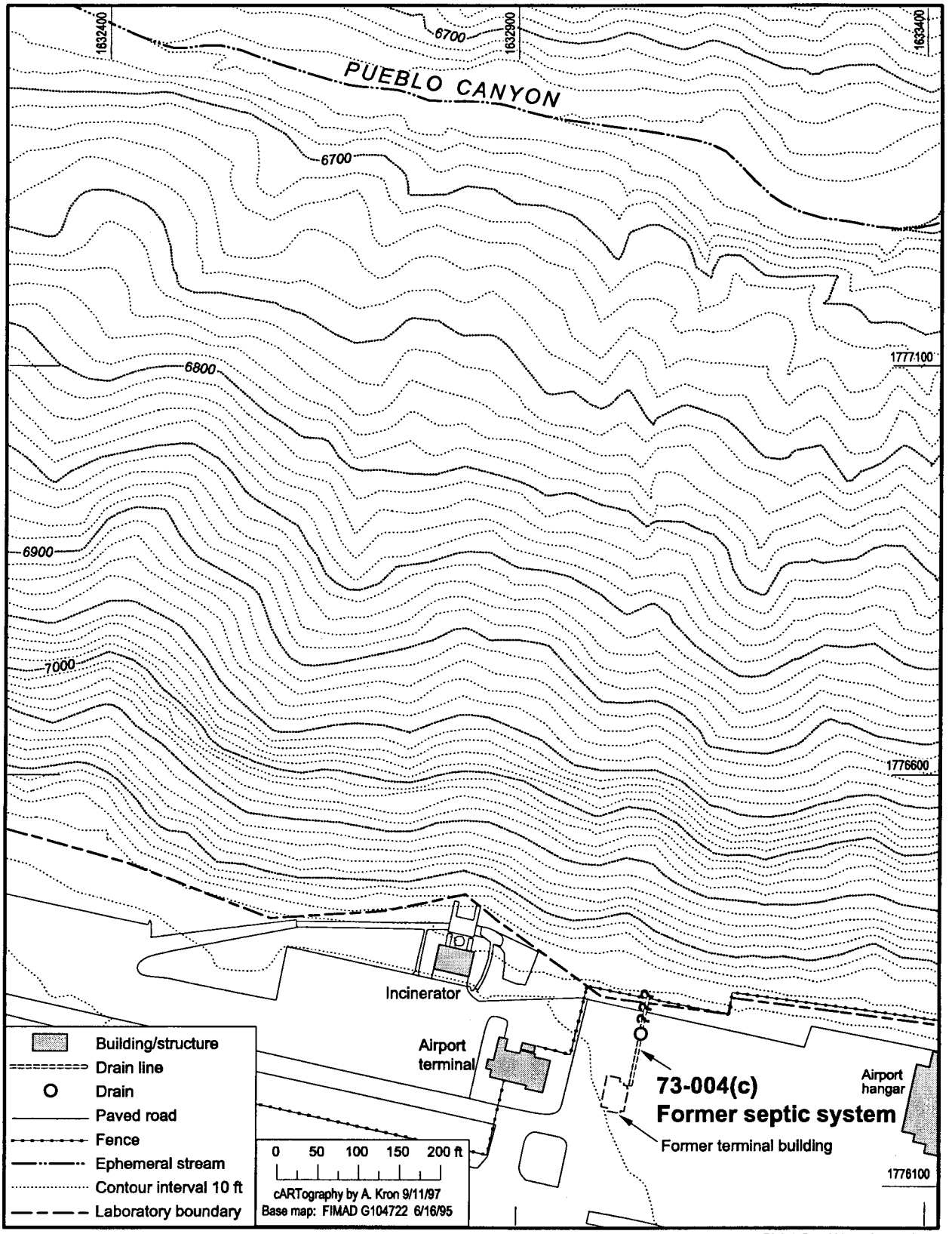
The former location of the original terminal building (and former septic system) is currently covered by a 250- x 270-ft, 9-in.-thick concrete pad, which was installed as part of the 1984 Los Alamos Airport Improvement Project.

There are no other SWMUs or AOCs in the immediate vicinity of SWMU 73-004(c). The closest SWMU is SWMU 73-003, a former steam-cleaning facility for municipal waste trucks, cans, and dumpsters, located approximately 120 ft west of SWMU 73-004(c). SWMU 73-003 is part of Consolidated Unit 73-002-99.

NOTE: Although an exhaustive search of Laboratory engineering records, Johnson Controls engineering records, and Laboratory archives was made, very little information about the original terminal building at the Los Alamos Airport exists. No as-built drawing providing the exact location of the septic tank exists. As-built ENG-C 39948 (sheet 2 of 9) (Attachment A) shows a sewer connection, but does not show a septic tank. The only records found that show the septic tank were ENG-PL-3959 (sheet 7 of 7) (Attachment C), an undated, unverified plan drawing showing a septic tank to the north of the original terminal building and an unnumbered 1954 Zia Company sewage distribution map (sheet 2 of 4) obtained from Bill Francis (Attachment D). The unverified drawings both indicate that the septic tank was located approximately 60–80 ft north of the building.

6.2.2 Operational History

The original terminal building and its associated septic system were constructed in the early 1950s (Nonno 2002, 73452 [Attachment B]; aerial photos [LASL 1951, 15501; LASL 1958, 15699] [Attachment E]). The restrooms were located in the northeast corner of the building and connected to a septic tank (located north of the building) by a 4-in.-diameter VCP (Francis 1997, 73288) (Attachment D) or tied directly into the Los Alamos township central sewage treatment facility (approximately one-half mile west of the terminal building).



F6.2-1_PermitMod02/091902/PTM

Figure 6.2-1. Location of SWMU 73-004(c), former airport terminal septic system

According to Francis, from the time of its construction until some date between 1954 and 1964, the septic tank discharged directly into Pueblo Canyon through a 4-in. VCP that ran north from the septic tank to the south edge of the canyon. Francis also stated that between 1954 and 1964, the terminal building restrooms may have been connected to the central sewage treatment facility for the township of Los Alamos, which was located nearby. In 1964, the county-managed Sewage Disposal Plant located in Bayo Canyon replaced the central sewage treatment facility. At that time, the terminal building restrooms were connected into a gravity-flow sewer main that connected to the new sewage treatment plant. (Francis 1997, 73288) (Attachment D); (Environmental Restoration Project 1997, 59367).

However, no as-built drawings showing the existence of a septic tank at the original terminal building could be located in several searches of the Laboratory's Engineering archive, Johnson Controls engineering records, or Laboratory archives. Also, the central sewage treatment facility was installed and in operation in the late 1940s, at least three to four years before the construction of the original terminal building. In the early days of Los Alamos, it was general practice to tie a facility into the sewage facility, rather than use a septic tank, unless the facility was located in a remote region. The original terminal building was located only a half mile east of the central sewage treatment facility; therefore, it is very possible that the terminal building was tied into the central sewage treatment building at the time of its construction in the early 1950s and the septic tank in question never existed.

The original terminal building was removed sometime between February 1970 and March 1971, according to LASL Engineering Drawing ENG-C 39948 (sheet 2 of 9) (Attachment A), which shows the as-built civil site plan for the current terminal building and includes the location of the former terminal with instructions for removing this structure and all associated lines. This engineering drawing is dated February 1970 and is marked with an as-built stamp dated March 1, 1971. Thus, it can be inferred that the former terminal building was removed within this time frame.

The terminal building was used solely for ticketing, baggage check/pickup, and air-traffic control (according to Wise in Attachment B). Spent oil from the routine maintenance of aircraft was disposed of in a designated area being investigated as SWMU 73-001(b), which is part of Consolidated Unit 73-001(b)-99. Thus, there is no evidence that the septic tank associated with the original terminal building managed anything other than sanitary waste.

In 1996, the investigating field team used the available engineering drawings to estimate distances from existing site features to the supposed location of the septic tank drainline and outfall. During two site visits, distances were measured in the field, and the resulting possible locations for the drainline were investigated using both steel rods to probe the estimated locations and shovels to dig out the areas. Neither the outfall nor the drainline was located using these methods. In addition, the canyon rim was visually inspected for a distance of 50 ft on either side of the estimated location of the pipe outfall. Again, no evidence of the drainline or the outfall was found. (LANL 1997, 59367)

In 1997, an electromagnetic geophysical survey was completed using a 20-ft grid placed over the entire 250- x 270-ft concrete pad that covers the area where the original terminal building and septic tank were located. Geophex conducted the survey using a Geonics EM-13 instrument. This instrument operates by using transmitter and receiver coils. The transmitter coil sets up circular currents in the ground parallel to the surface and decreasing in magnitude with depth. Each current loop generates a magnetic field (parallel to the ground) that is picked up by the receiver coil. The survey is conducted holding the instrument approximately 1 meter from the ground surface and walking a pre-specified grid. No anomalies representative of the septic tank or its associated drainlines appear in the resulting data. Although not conclusive, the geophysical survey results strongly indicate that the septic tank is not in place. (Nonno 2002, 73451) (Attachment F)

6.3 Land Use

6.3.1 Current

SWMU 73-004(c) is located within the Los Alamos Airport, an industrial area owned by DOE and leased to the County of Los Alamos. A 6-ft barbed-wire fence interspersed with sections of chain-link fence encloses the entire airport. Entrance can be obtained only through the terminal building or through one of three locked gates. Access is restricted to airport personnel, commercial and private pilots, and passengers. These security measures discourage the possibility of inadvertent site intrusion.

6.3.2 Future/Proposed

SWMU 73-004(c) is located on 1 of 10 parcels of land originally identified in 1998 for transfer and conveyance from the DOE to the County of Los Alamos or to the Secretary of the Interior in trust for the Pueblo of San Ildefonso. Since that time, this parcel, known as the Airport Parcel, has been subdivided into five smaller sub-parcels in order to accelerate transfer activities. The current terminal building and the former site of the original terminal building [SWMU 73-004(c)] are located within the Airport-2 North Subparcel. This subparcel comprises 92.6 acres and is currently scheduled for transfer to the County of Los Alamos in September 2005. It is understood that the county will retain the use of this land sub-parcel as an airport facility.

6.4 No Further Action Proposal

6.4.1 Rationale

The Laboratory's RRES-R Program is proposing SWMU 73-004(c) for NFA based on the following:

- RRES-R personnel made a reasonable, comprehensive, and adequate search of archival records to locate an as-built engineering drawing or other document providing the location of the septic tank and drainline potentially associated with original terminal building at the Los Alamos Airport. No such document was located in an exhaustive search of Laboratory engineering records, Johnson Controls engineering records, and Laboratory archives. However, an undated, unverified plan drawing and an unverified 1954 sewage distribution map indicate the location of the septic tank to be approximately 60–80 ft north of the original terminal building.
- RRES-R personnel made a reasonable, comprehensive, and adequate attempt to physically locate this SWMU by siting the septic tank and associated drainline based on the available engineering drawings, by probing this area with a steel rod, by digging trenches in the area, and by conducting a visual inspection of the canyon rim to locate the drainline outfall. None of these activities provided any trace of the septic system.
- An electromagnetic geophysical survey conducted in 1997 indicates that the septic system is not in place.
- There is no reason to suspect that the septic tank associated with the original terminal building managed anything other than sanitary waste. The terminal building was used solely for ticketing, baggage check/pickup, and air-traffic control.

Thus, after making a reasonable and adequate attempt to locate SWMU 73-004(c), the RRES-R Program has demonstrated that the septic tank does not exist.

6.4.2 Criterion

Based on the information presented in Sections 6.2 through 6.4 of this proposal, SWMU 73-004(c) is being proposed for NFA under Criterion 1.

6.5 Supporting Documentation Attached

Attachment A: LASL Engineering Drawing ENG-C 39948 (sheet 2 of 9). (LASL 1970, 25690)

Attachment B: Nonno telephone interviews with Francis and Wise regarding original airport terminal building. (Nonno 2002, 73452)

Attachment C: LASL Engineering Plan Drawing ENG-PL-3959 (sheet 7 of 7). (LASL undated, 73289)

Attachment D: Francis memorandum with attached Zia Co. map and Los Alamos County drawing. (Francis 1997, 73451)

Attachment E: Archival aerial photographs. (LASL 1951, 15501; LASL 1958, 15699)

Attachment F: Electromagnetic survey results + overlay. (Nonno 2002, 73451)

6.6 References Used for Text of the Proposal for Permit Modification

Environmental Restoration Project, September 1997. "NFA Report for Potential Release Sites 0-034(a), 0-034(b), 73-001(b), 73-004(c), 73-004(d)," Los Alamos National Laboratory report LA-UR-97-3864, Los Alamos, New Mexico. (Environmental Restoration Project 1997, 59367)

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1071," Los Alamos National Laboratory report LA-UR-92-810, Los Alamos, New Mexico, pp. 5-191 to 5-204. (LANL 1992, 07667)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Volume I, Los Alamos National Laboratory report LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 07511)

6.7 History of Regulatory Deliverables

LANL, May 1992: RFI work plan for OU 1071 submitted to EPA. (LANL 1992, 07667)

EPA, October 16, 1992: NOD for OU 1071 RFI work plan. (EPA 1992, 11794) No NODs apply to SWMU 73-004(c).

LANL (via DOE-LAAO) November 16, 1992: Response to NOD for OU 1071 RFI work plan submitted to EPA via DOE-LAAO. (DOE-LAAO 1992, 14694)

EPA, January 6, 1993: Approvals of OU 1071 RFI work plan and LANL response to NOD. (EPA 1993, 58861.209)

LANL, September 30, 1997: Submittal of NFA report for PRSs 00-034(a), PRSs 00-034(b), 73-001(b), 73-004(c), 73-004(d). (LANL 1997, 56660)

6.7.1 References for Regulatory Deliverables

LANL(Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1071," Los Alamos National Laboratory report LA-UR-92-810, Los Alamos, New Mexico. (LANL 1992, 07667)

EPA (US Environmental Protection Agency), October 16, 1992. "RFI Work Plan for OU 1071, Los Alamos National Laboratory, NM0890010515," (Notice of Deficiency) US Environmental Protection Agency letter to J. Bellows (Area Manager, DOE-LAAO) from W. Honker (Chief, Permits Branch, EPA Region 6), Dallas, Texas. (EPA 1992, 11794)

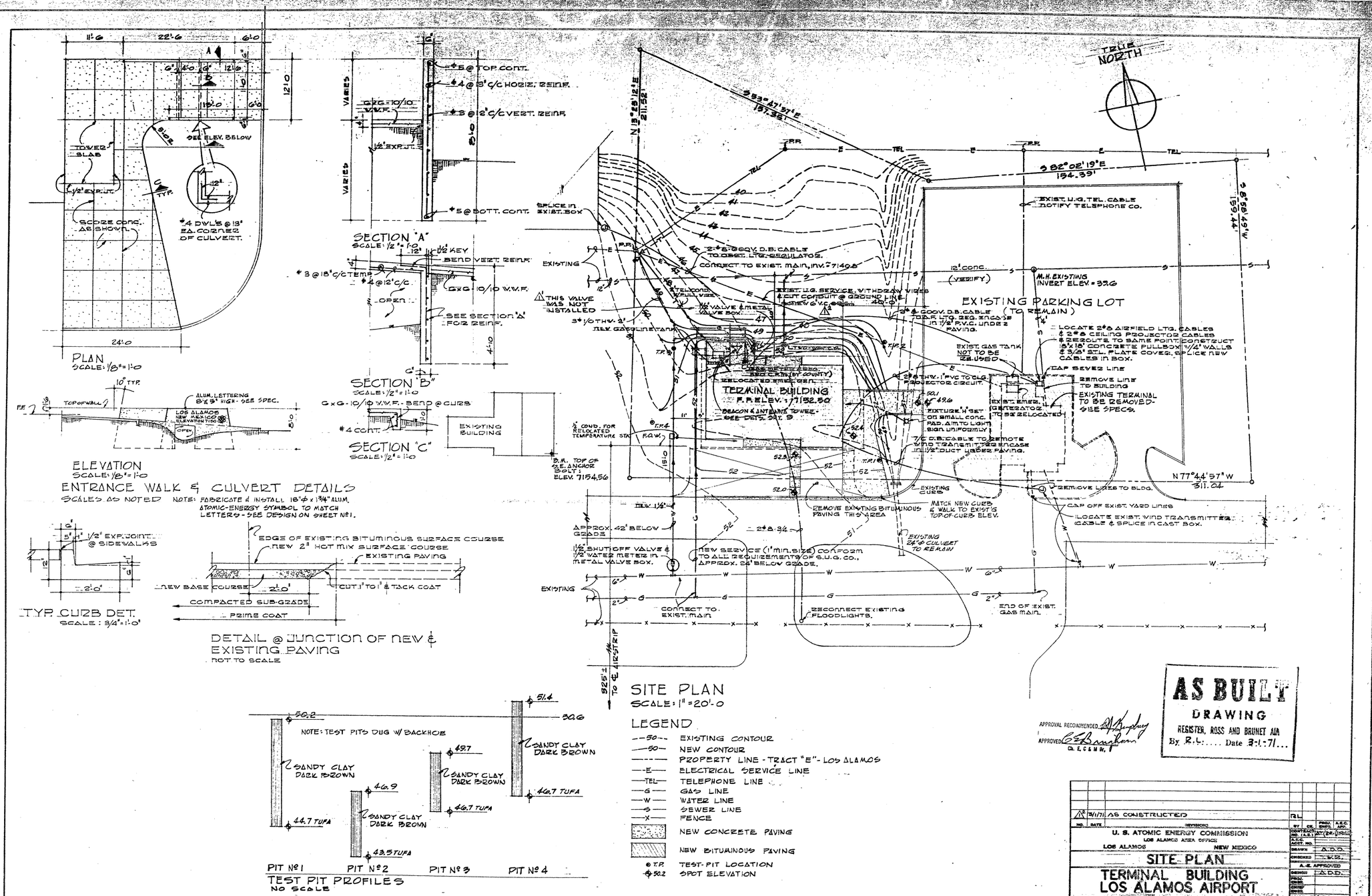
DOE-LAAO (US Department of Energy- Los Alamos Area Office), November 16, 1992. Transmittal Letter for LANL response to Notice of Deficiency on RFI work plan for OU 1071, DOE/LAAO letter (LESH:4SS-024) to W. Honker (EPA Region 6, RCRA Permits Branch Chief) from J. Vozella (DOE-LAAO), Acting Chief, ESH Branch), Los Alamos, New Mexico. (DOE-LAAO 1992, 14694)

EPA (US Environmental Protection Agency), January 6, 1993. EPA approval letter for RFI work plan for OU 1071, EPA letter to J. Bellows (DOE-LAAO Area Manager) from A. Davis (Director, EPA Region 6 Hazardous Waste Management Division), Dallas, Texas. (EPA 1993, 58861.209)

LANL(Los Alamos National Laboratory), September 30, 1997. Transmittal letter for "NFA Report for Potential Release Sites 0-034(a), 0-034(b), 73-001(b), 73-004(c), 73-004(d), Field Unit 1," Los Alamos National Laboratory report LA-UR-97-3864, Los Alamos, New Mexico. (LANL 1997, 56660)

73-004(c)

ATTACHMENTS



5683-I

Attachment A

73-004(c)

Attachment B

73-004(c)

E/ER TELEPHONE LOG

CALLS TO: Bill Francis, former Chief of the Zia Co. Construction & Maintenance Division, 672-1361 and to
Harry Wise, former Superintendent of Transportation for the Zia Co, 344-1520.

CALLS FROM: Linda Nonno, Regulatory Compliance Focus Area

DATE: April 8, 2002

SUBJECT: Original terminal building, Los Alamos Airport

BACKGROUND:
In preparation for writing a Petition for Permit Modification, more information was required to support the NFA determination for SWMU 73-004(c). The construction dates provided in the April 7, 1997, memo entitled "Sewer System at the Original Airport Terminal Building" from Bill Francis seemed inaccurate based on a 1948 Atomic Energy Commission topography map (U.S. AEC 1-08227) that I had located showing the terminal building was not present in 1948.

First, I called the Los Alamos County Engineering Department to inquire if they had any engineering drawings or early photographs of the original airport terminal building. The county had no records, but suggested that I call Tony Lujan (662-6117) who had worked in the original terminal building. Mr. Lujan informed me that he had started working in the building circa 1960, but had no idea when it had been constructed. He suggested that I call his former supervisor, Harry Wise, who he was sure would know the construction dates. So I telephoned Mr. Wise.

I also called Bill Francis to inquire if it was possible that he might not have been correct about the building's construction dates.

DISCUSSION:

On April 8, 2002, Mr. Wise provided me with the following information:

Mr. Wise came to Los Alamos in 1946, when he was a provost marshal in the U.S. Army. In 1947, he left the military and started his position as Transportation Superintendent for the Zia Company. Mr Wise stated positively that the original terminal building was built in the early 1950s (1952 or 1953). He wasn't surprised that I was unable to locate an as-built engineering drawing for the terminal because it was a wooden, shingle-covered structure not meant to be a permanent building. He went on to say that the terminal building contained two restrooms, but he didn't know whether the restrooms were tied into a septic tank or into the sanitary sewer system. He further stated that the terminal building contained a waiting room and a glass-enclosed air-traffic control room. The terminal building was operated solely to process passengers and their baggage and to control air traffic.

On April 8, 2002, Mr. Francis provided me with the following information:

Mr. Francis is the former Deputy Manager of the Zia Company (now Johnson Controls Northern New Mexico) and former Chief of the Zia Company Construction & Maintenance Division. He worked for the Zia Company from 1947 until his retirement in 1983. I told him that I had spoken to Mr. Wise, who had provided me with a construction date of the early 1950s for the original terminal building and asked him what document he had used to determine the 1946-47 construction dates provided in his 1997

memo. Mr. Francis told me that he had based the 1946-47 construction dates entirely on his memory, and it was possible that he may have been incorrect. I asked him if it was possible that the septic system to the original terminal building might have managed anything other than sanitary waste. He replied that he was positive that it had not. He also stated that he would try to locate the 1954 Zia Company Townsite Sewage Distribution map and the 1964 Bayo Sewage Disposal plant diagram referred to in his 1997 memo for me.

NOTE 1: Mr. Francis subsequently located both diagrams for me and provided me with copies. I have attached the drawings to his original memo for submittal to RPF.

NOTE 2: In addition, I have located two aerial photographs (in RPF) that place the construction dates for the terminal building between 1952 and 1958. One is a 1951 photo, ER ID # 15501, showing that the terminal building is not present; thus, confirming that the 1946-47 construction dates provided by Francis are incorrect. The second is a 1958 photo, ER ID # 15699, that shows the terminal building is present.

Linda Nonno

Linda Nonno

SEWER - 4" FORCE MAIN

SEWER LIFT STATION

HAMBE PLACE

AIRPORT ROAD

AIRSTRIP LIGHTS

LOS ALAMOS AIRSTRIP

EXISTING SAN. SEWER MANHOLE

AIRPORT ROAD

PUBLIC PARKING — 20 CARS

NEW SIDEWALK

TAXI PARKING

NEW ELECTRIC, TELEPHONE & FIRE ALARM SERVICES

EXISTING SEPTIC TANK

NEW CURB

TEMPORARY CONSTRUCTION FENCE

REMOVE EXISTING FENCE, CURB, & PAVING

EXISTING CHAIN LINK FENCE

EAST

GAS PRV STATION

6"-100# GAS

8"-100# GAS

F.H.

14" WATER

8"-300# GAS

8"-WATER

7140

7150

7160

7170

7120

7130

PLOT PLAN — MECHANICAL & ELECTRICAL SERVICES

GRAPHIC SCALE —

50 0 50 100 150 FEET

LEGEND -

NEW		EXISTING
	BUILDING	
	FENCE	
	CONTOURS	
SS	SANITARY SEWER	S.S.
W	WATER	W
G	GAS	G
	FIRE HYDRANT	F.H
T	TELEPHONE	T
E	ELECTRICAL	E
F.A.	FIRE ALARM	F.A.

NO.	DATE	REVISIONS	BY	CHKD	GRP.	D. O.	GRP. LDR.	ENG. D. O.

AUTHORIZED FOR: HEALTH, SAFETY, FIRE PROT., SECC.

LOS ALAMOS SCIENTIFIC LABORATORY
ENGINEERING DEPARTMENT
UNIVERSITY OF CALIFORNIA—LOS ALAMOS, NEW MEXICO

NEW AIRPORT TERMINAL FAC.
PLOT PLAN -
MECH. & ELECT. SERVICES
BLD'G. ULR-195 TA-0

CHECKED	RECOMMENDED	APPROVED
PROJ. ENG.	GROUP LEADER	ENG. DEPT. OFFICE
DESIGNER	DATE	DRAWING NO.
DRAWN McCRACKEN	SHEET 7 OF 7	ENG-PL-3959
SCALE AS NOTED		
C.A. NO.	B. A. NO.	L. J. NO. 3888-0

K+E FRENCH & RICHARDS LA ESA

+-amtec

5683-J

Attachment C
73-004(c)

Received by ER-RPF
SEP 05 2002

#73453

Attachment D
73-004(c)

Los Alamos
NATIONAL LABORATORY

memorandum

Chemical Science and Technology
Responsible Chemistry for America

Environmental Restoration Project/CST-18
Los Alamos, New Mexico 87545

To/MS: Carl Newton, ESS-1, MS E525
From/MS: William C. Francis, CST-18, MS E525 W.C.F.
Phone/FAX: 7-6080/5-4632
Symbol: ER-WCF-97-23
Date: April 7, 1997

SEWER SYSTEM AT THE ORIGINAL AIRPORT TERMINAL BUILDING

The original Airport Terminal Building was constructed in 1946-1947. There were two restrooms in the northeast corner of the building and these restrooms were connected to a septic tank located about 80'-0" north of the building by a 4" vitrified clay pipe line.

A 1954 Zia Company Townsite Sewage Distribution maps shows that the Eastern Housing Area was connect to the Central Sewage Disposal Plant by a 4" force main that originated at a pumping station northeast of the Nambe Place cul-de-sac and that the Airport Terminal Building was still serviced by its septic tank.

In 1964 The Bayo Sewage Disposal Plant became operative after a gravity flow sewer main connecting it to the influent to the Central Sewage Disposal Plant was completed. The Eastern Housing Area and the Airport Terminal Building were connected to this sewer main and the pumping station and the force main back to the Central Sewage Disposal Plant were abandoned.

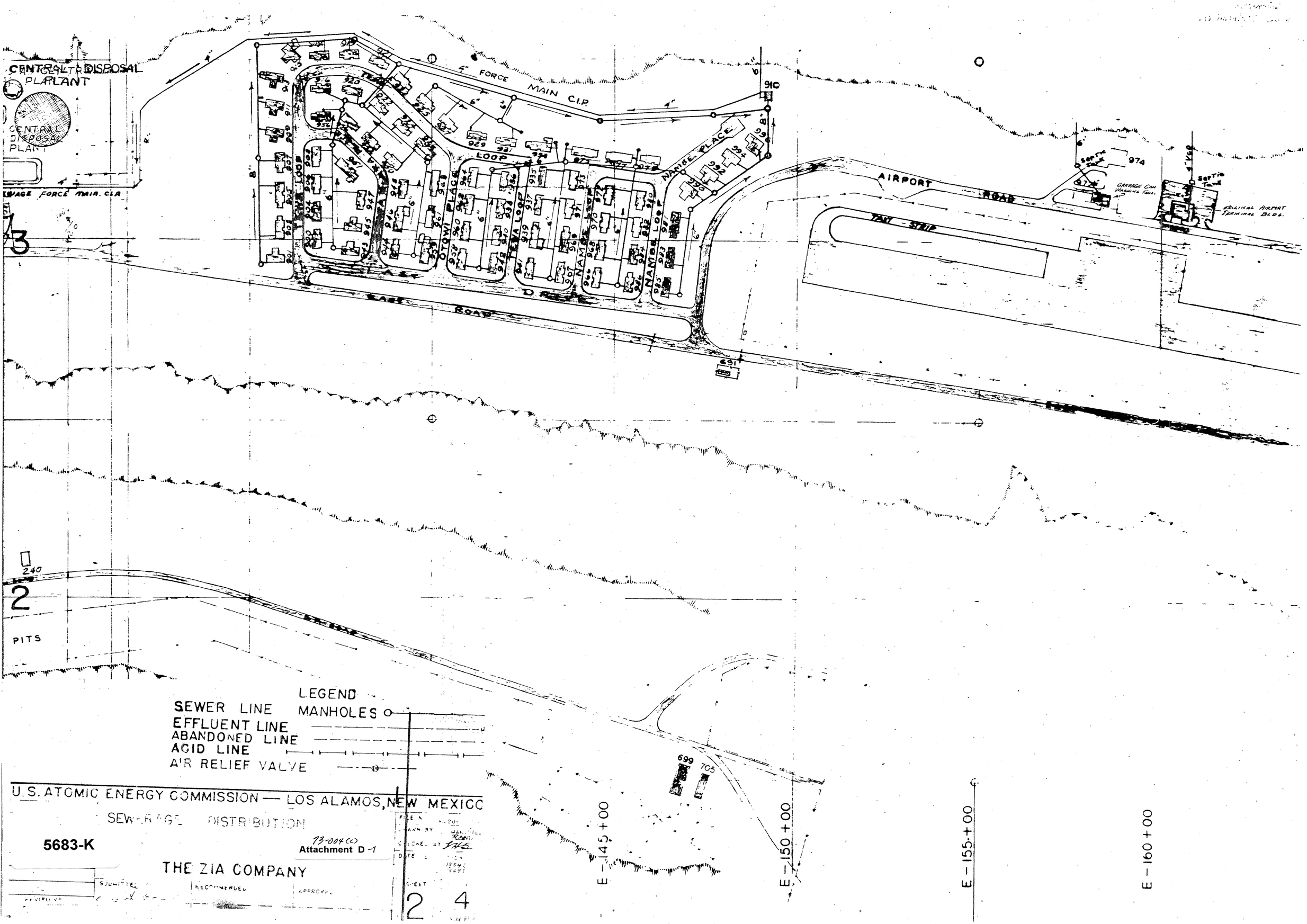
A 1970 Construction Site Plan of the present Airport Terminal Building, Eng-C39948, shows the old terminal building connected to the 12" sewer main running to the Bayo Sewage Disposal Plant at a manhole 67'-6" north of the old terminal building. Notes on this drawing instruct the building contractor to remove the old terminal building, to remove about 14'-0" of the 4" sewer lateral between the north wall of the old terminal building and the south edge of an existing parking lot and to cap the sewer lateral at the south edge of the parking lot.

It seemed reasonable to me that sometime between 1954 and 1964 that the old terminal building could have been connected to the Central Sewage Disposal Plant by its own force main via the pumping station for the Eastern Housing Area. I therefore checked at the County Utility Department with Paul Pizzoli and Pat Dugan. They have no record of the old terminal building having a sewage pump station nor do the county sewer system drawings show one or a force main west to the Eastern Housing Area. Their drawings do show the abandoned force main from the northeast corner of the Eastern Housing Area back to the now demolished Central Sewage Disposal Plant.

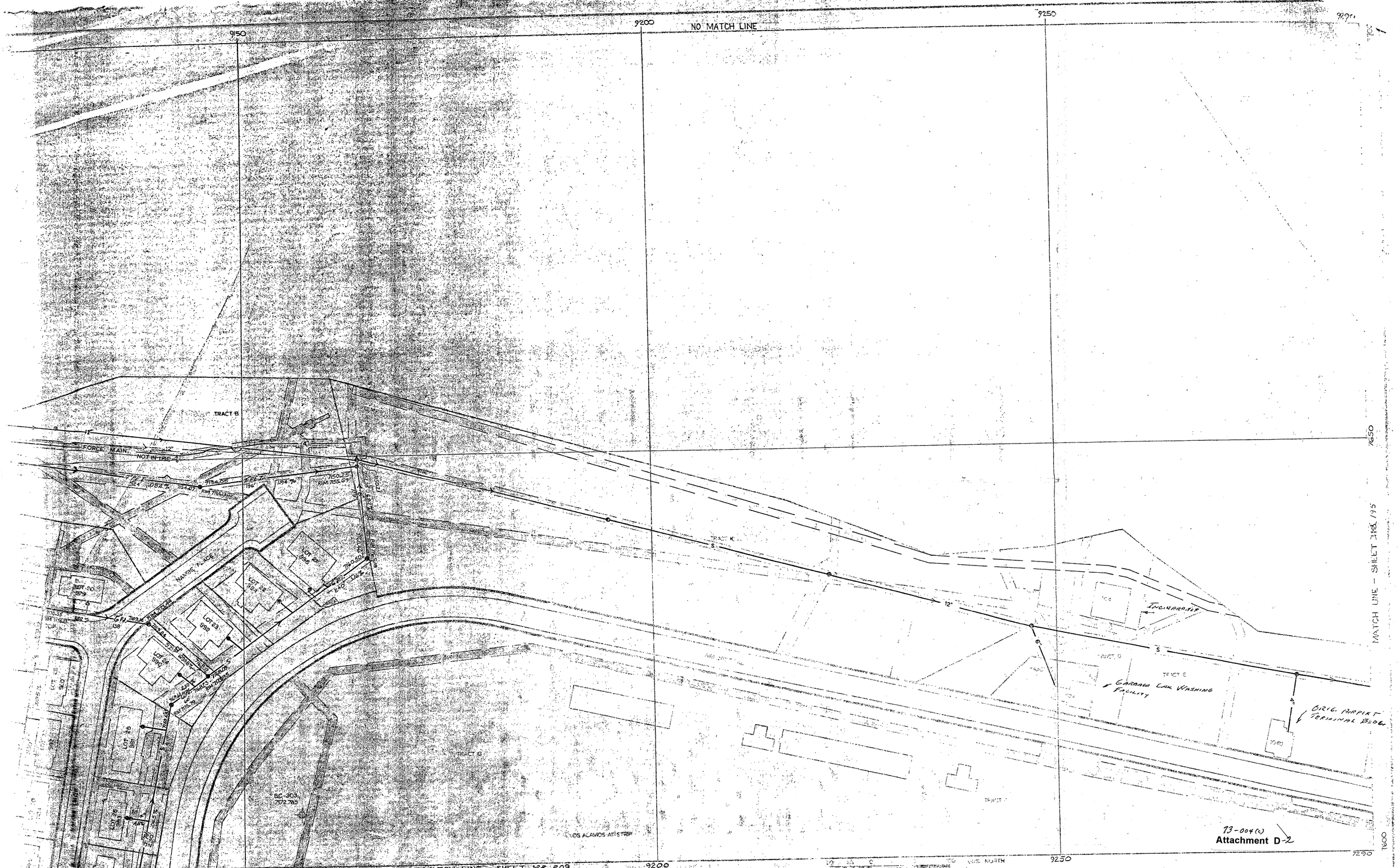
To recapitulate the history of the sewer system at the original Airport Terminal Building; the 4" vitrified line and septic tank were built in 1946-1947, they were in service until sometime in 1964 when the line from the building was connected to the new sewer main running to the Bayo Sewage Disposal Plant and the septic tank either abandoned or removed and then the 4" line connecting the old terminal building to the new sewer main was capped at the south edge of the old parking area and abandoned in 1970 when the new terminal building was built.

Attachment 1: 1954 Zia Company townsite sewage distribution map
Attachment 2: 1964 Los Alamos County Drawing of the Los Alamos sewer system

Note: LASL Drawing ENG-C39948 is filed separately as ER ID 25690



73-004(c)
Attachment D-1


NO MATCH LINE
9150
9200
9250
9290
7650
7600
TRACT B
FORCE MAIN
NOT IN USE
12"
NAVAJO TRACE
LOT 20 BSC
LOT 23 BSC
LOT 24 BSC
LOT 25 BSC
LOT 26 BSC
LOT 22 BSC
LOT 21 BSC
TRACT K
TRACT G
TRACT E
TRACT D
TRACT C
TRACT A
INCINERATOR
GARBAGE CAN WASHING FACILITY
ORIG. AIRPORT TERMINAL BLDG.
BC-303
LOS ALAMOS AIRSTRIP
MATCH LINE - SHEET 209
MATCH LINE - SHEET 195
SCALE 1" = 100'
73-004(2)
Attachment D-2
LOS ALAMOS COUNTY DRWG. CIRCA 1964
SANITARY SEWER SYSTEM
LOS ALAMOS, NEW MEXICO
DESCRIPTION
DRAWN BY
APPROVED
5683-L
104

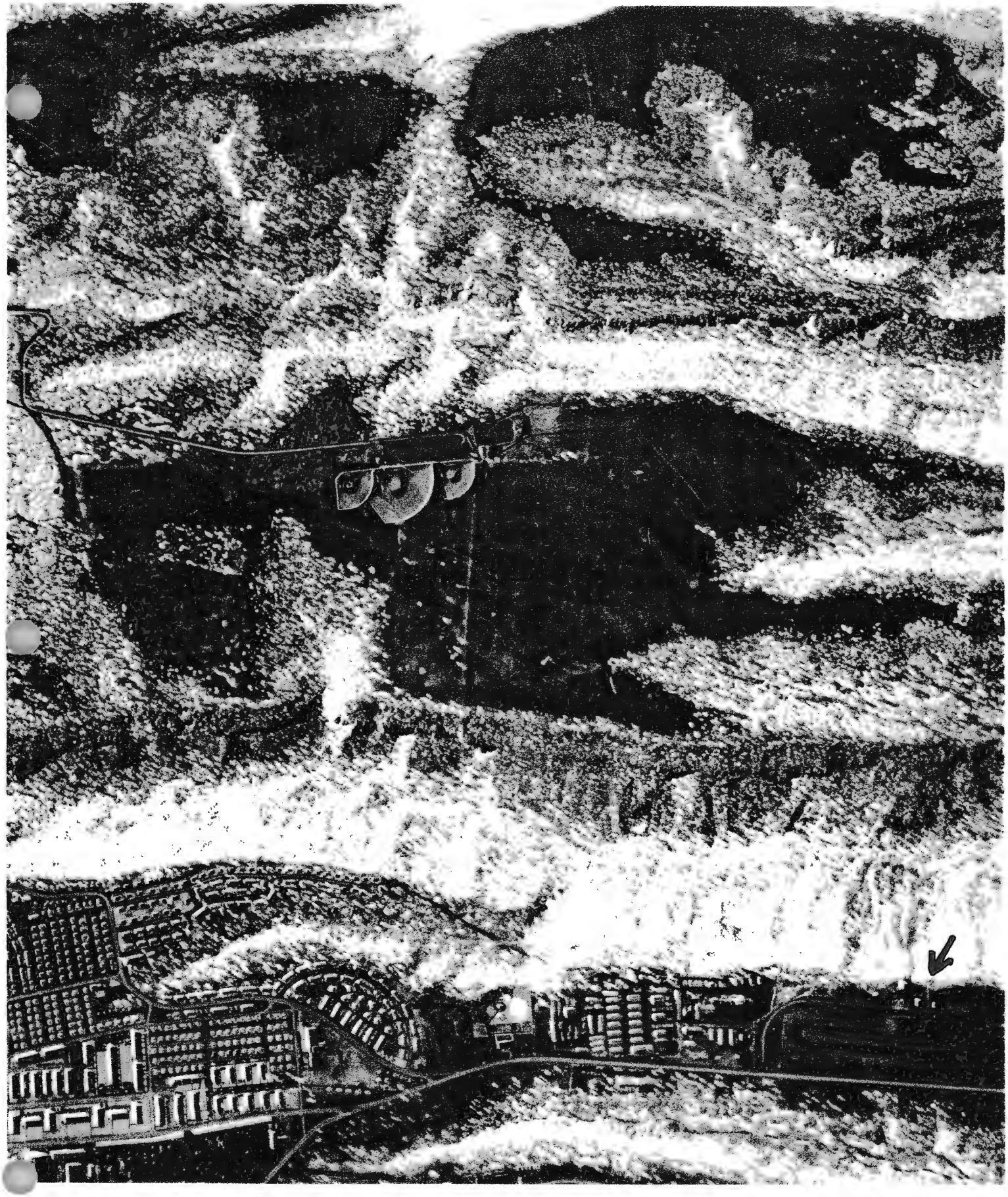
Attachment E

73-004(c)

Photographs of SWMU 73-004(c)

(1) 1951 aerial photograph showing that airport terminal building is not present

(2) Aerial photograph dated November 22, 1958 showing airport terminal building



ERID 15501

M486 1372MCSUSAF 22NOV58 12200FT AF58-25-5 ROLL-2

ER Record I.D.

M486 1372MCSUSAF 22NOV58 12200FT AF58-25-5 ROLL-2

ER ID 15699

Attachment F
73-004(c)

NOTE: Attachment F includes supplemental information regarding the geophysical survey for SWMU 73-004(c) and the results of that survey. An overlay showing the location of the former airport terminal building is included at the end of Attachment F for use in reviewing the geophysical survey results. Align the north-pointing arrows and the manhole, marked on the in-phase and quadrature results, to view the survey results for the area 60–80 ft north of the former terminal building, where the septic tank was reported to be.

74-003(c)

Attachment F

SUPPLEMENTAL INFORMATION REGARDING GEOPHEX ELECTROMAGNETIC SURVEY FOR SWMU 73-004(c)

BACKGROUND:

In preparation for writing a Petition for Permit Modification, I needed to locate a memo referenced in a 1997 NFA report (LANL 1997, 59367), which includes an NFA proposal for SWMU 73-004(c), a septic tank associated with the original terminal building at the Los Alamos airport. I wanted to review the results of the electromagnetic survey in order to determine if they would confirm or deny the presence of the septic tank and use the results to support the petition requesting that this SWMU be removed from the Laboratory's Hazardous Waste Facility Permit.

The NFA report cites a memorandum attributed to Carl Newton (former Operable Unit Project Leader for TAs-0 and -73, now retired from the Laboratory) entitled "Geophex Survey of PRS 73-004(c) Area East of the Airport Terminal Building." There is no record of the memorandum or the Geophex results in the ER Records Processing Facility, so I asked Terry Rust (the current Team Leader for TAs-0 and -73) if he had a copy of the memo or of the electromagnetic survey results. Terry also was unable to locate either the memo or the survey results, but suggested the possibility that one or both of these items had been misfiled in the records that he had obtained from Carl Newton. I searched through the Newton files and finally located the memorandum with the attached results of the electromagnetic survey performed by Geophex.

DISCUSSION:

The original airport terminal building was constructed in 1952-53. Laboratory-related septic tanks from this era were constructed either entirely of metal or of metal-rebar-reinforced concrete. Which of these materials the SWMU 73-004(c) septic tank is constructed of is unknown, but either material would show up clearly in an electromagnetic survey. After reviewing the electromagnetic survey results for the area in the vicinity of the original terminal building, I concluded that the results denied the presence of the septic tank. If the septic tank were present, it would have shown up as a red/yellow anomaly similar to the way the manhole shows up in the 9210-Hz in-phase and quadrature results (attached) and as a red/blue anomaly similar to the way the manhole is indicated in the 15,210-Hz in-phase and quadrature results (attached), However, because this is not my area of expertise, I consulted Steve Pearson (a geologist with the ER Project who has supervised a number of electromagnetic surveys) and Carl Newton (the geophysicist [now retired] who supervised the Geophex survey for the SWMU 73-004[c] septic tank).

On April 22, 2002, I asked Steve Pearson to review the Geophex survey results. He wanted to know a little more about the physical aspects of the area surrounding the former terminal building and suggested that we visit the airport. So with engineering drawings and the Geophex survey results in-hand, we went out to the airport. We easily located the manhole and fire hydrant and ascertained that the red/yellow anomaly on the Geophex 9210-Hz in-phase results to the right of the fire hydrant and spanning the grid horizontally from 40 to 270 ft was caused by a 2-ft-high guard rail (similar to ones found on highways). The red/yellow anomaly spanning the grid vertically from 0 to 100 ft was caused by a 6-ft chain-link fence. The red/yellow anomaly spanning the grid vertically from 100 to 160 ft was caused by electrical conduits and light poles.

Steve said that he wasn't sure what the dark blue area on the 9210-Hz in-phase results represented. He stated that the subtle conductivity contrasts (i.e., between the medium and dark blue shades) were probably related to differences in soil properties such as variation in soil type, moisture, or density. He speculated that, given the rectangular shape, the anomaly could be related to the former presence of a parking lot, the footprint of a building, or some other activity that would have changed the physical properties of the soil in this area. I asked him why the rebar in the concrete-paved area wasn't registering in the results, and he explained that the instrument used to conduct the survey had probably been calibrated to mask out this type of interference. I told Steve that I disagreed with the last

sentence on the memo-to-file regarding the Geophex results, which stated: "Either the septic tank was removed or its presence is masked by the local background conductivities". Steve said that he agreed with me because, if the septic tank was constructed entirely of metal, it would be indicated as a positive red anomaly on the Geophex results (just as clearly as the manhole, fire hydrant, guardrail and fences are indicated on the results) and if it were constructed of rebar-reinforced concrete, it would also show up but not as clearly as the objects constructed entirely of metal. Steve also stated that, in his opinion, the 9210-Hz in-phase and quadrature results and the 15,210-Hz in-phase and quadrature results taken as a whole provide a good indication that the septic tank is not present.

On April 24, 2002, I met with Carl Newton. Carl stated that he had only received the set of results from Geophex labeled "preliminary." He said that the preliminary results provided adequate information about the septic tank; therefore, he never requested "final" results.

Carl explained that the dark blue area on the 9210-Hz in-phase results probably represented a former municipal-landfill trench that had been excavated sometime prior to 1971. The contents of the former trench had been reburied in a new trench located to the east of the original landfill. He said that the details of this activity were described in the OU 1071 work plan.

I told Carl that both Steve and I disagreed with the last sentence on his memo-to-file regarding the Geophex results, which stated: "Either the septic tank was removed or its presence is masked by the local background conductivities". Carl said that he was merely trying to provide a general statement about the electromagnetic survey results. However, given the types of anomalies indicated in the 9210-Hz in-phase results, if the septic tank was in place, he would expect it to have a strong signal relative to the former landfill trench. Because this is not the case, he feels that the Geophex results provide a strong indication that the septic tank is not present.

Carl was not able to answer some of the questions I asked him during the April 24, 2002, interview. However, he took notes and promised to look through his files to find the information I requested. On May 23, he provided me with the following additional information.

The instrument used by Geophex to conduct the electromagnetic survey was a Geonics EM-13 (manufactured by Geonics, Ltd., Ontario, Canada). This instrument operates by using transmitter and receiver coils. The transmitter coil sets up circular currents in the ground parallel to the surface and decreasing in magnitude with depth. Each current loop generates a magnetic field (parallel to the ground) that is picked up by the receiver coil. The survey is conducted holding the instrument approximately 1 meter from the ground surface and walking a pre-specified grid. Quadrature results are representative of soil conductivity while in-phase results are significantly more sensitive for detecting metal objects.

Attachment: Geophex memorandum (1 page) and electromagnetic survey results (4 pages).

Linda Nonno

MEMO TO FILE
22 September 1997

GEOPHEX SURVEY OF PRS 73-004(c) AREA EAST OF AIRPORT TERMINAL BUILDING

Geophex provided an annotated set of color images of Preliminary results from the soil conductivity surveys. The four plots were for In-phase and Quadrature components at 9210Hz and 15,210 Hz.

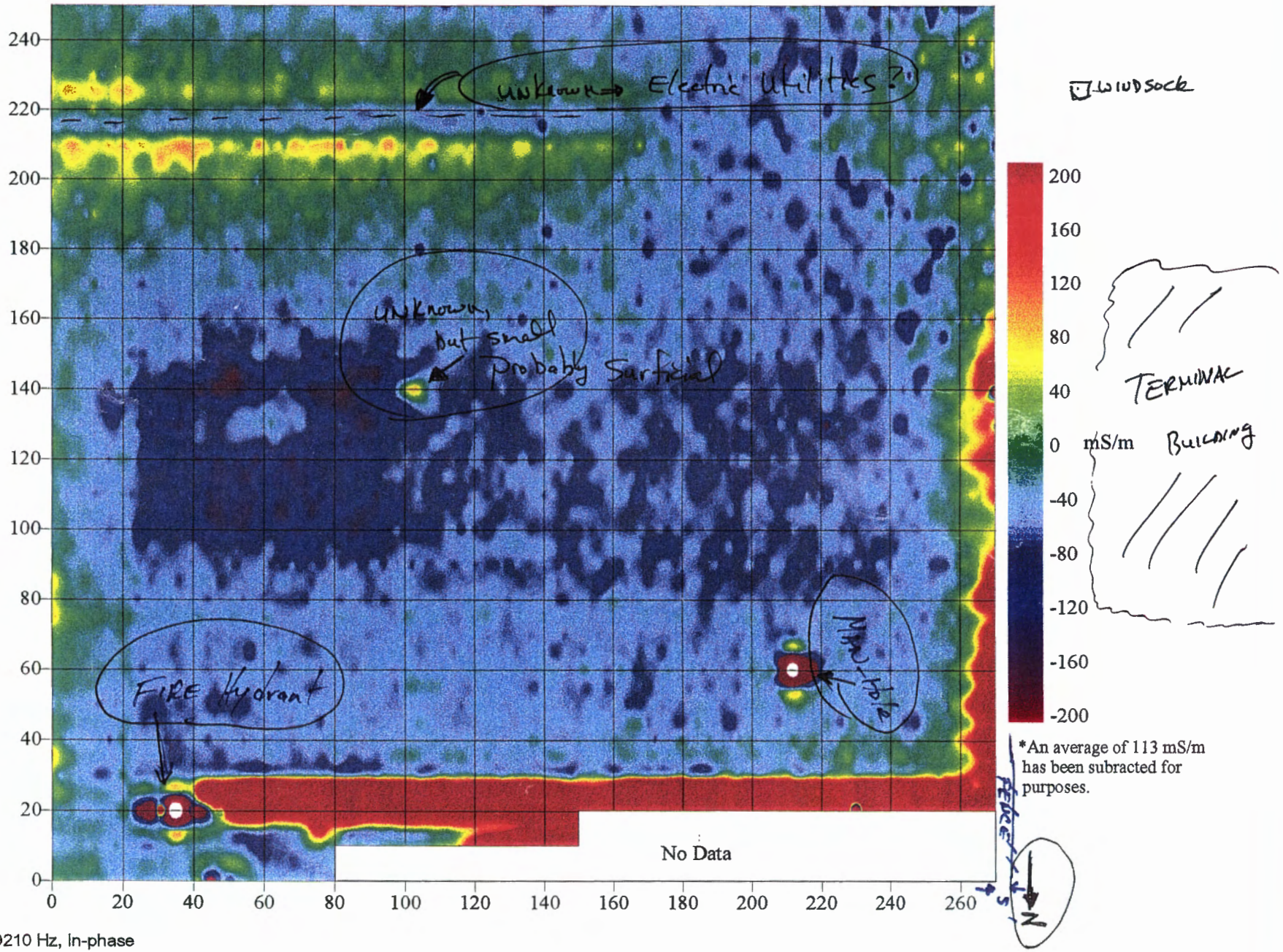
Obvious anomalies on each image were a manhole of the sanitary sewer that formerly carried waste from the old terminal building, after the septic tank was replaced by sending the sanitary waste to a waste water treatment plant, and a fire hydrant at the north edge of the airplane boarding area. A small minor anomaly, marked 'unknown, but small probably surficial' is on In-phase images, more pronounced at 9210 Hz than 15,210 Hz. This is located more than 80 feet east of the likely location for 73-004(c).

Further processing of the conductivity survey data was not warranted due to the lack of any target in the expected area of PRS 73-004(c) on any of the 4 images, let alone any feature in a likely area that correlated between any pair of images.

Either the septic tank was removed or its presence is masked by the local background couductivities.

Airport TA-73-004(c) 9,210 Hz, In-phase

Preliminary

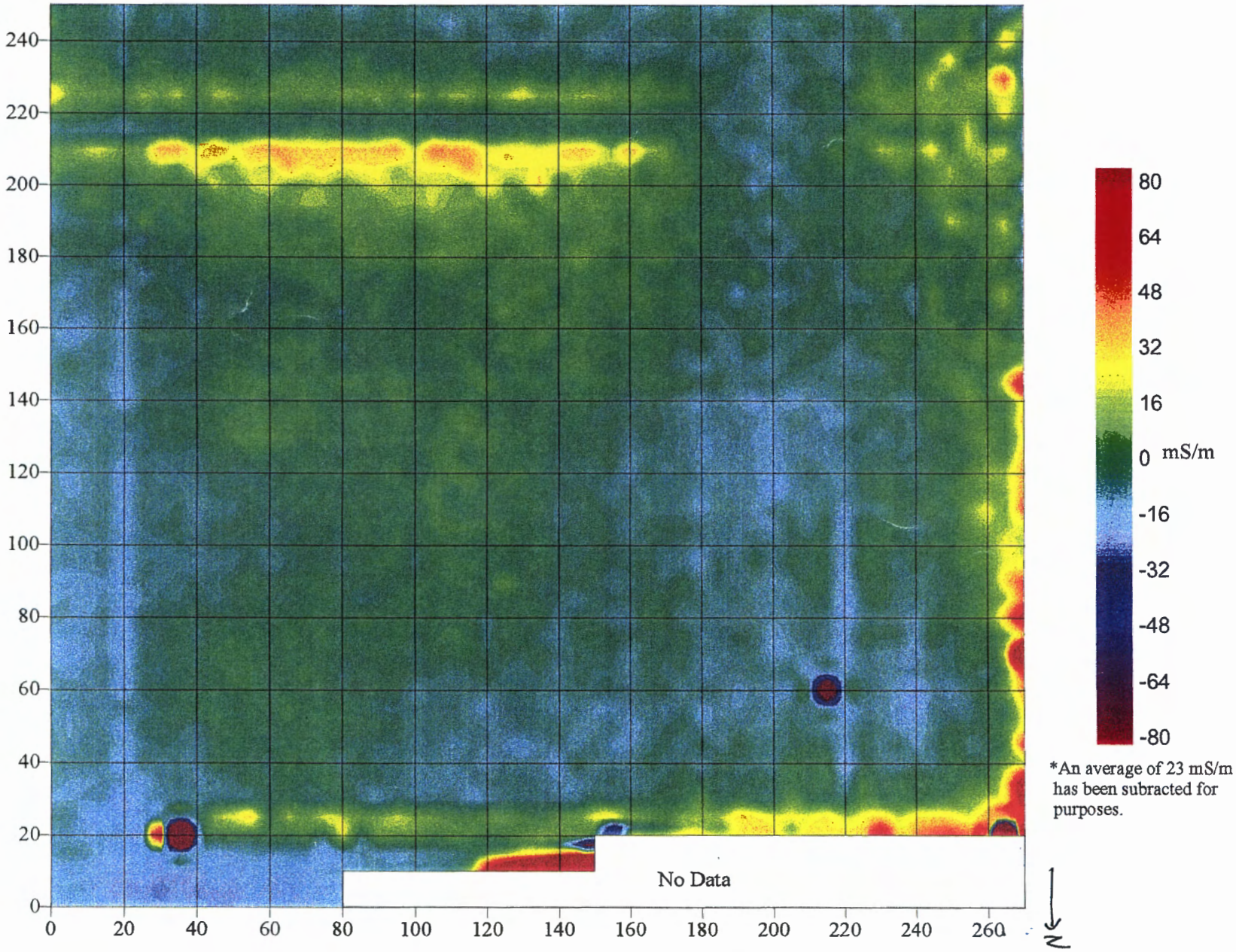


*An average of 113 mS/m has been subracted for purposes.

Plot of: dktest2-9210 Hz, In-phase

Airport TA-73-004(c) 9,210 Hz, Quadrature

Preliminary

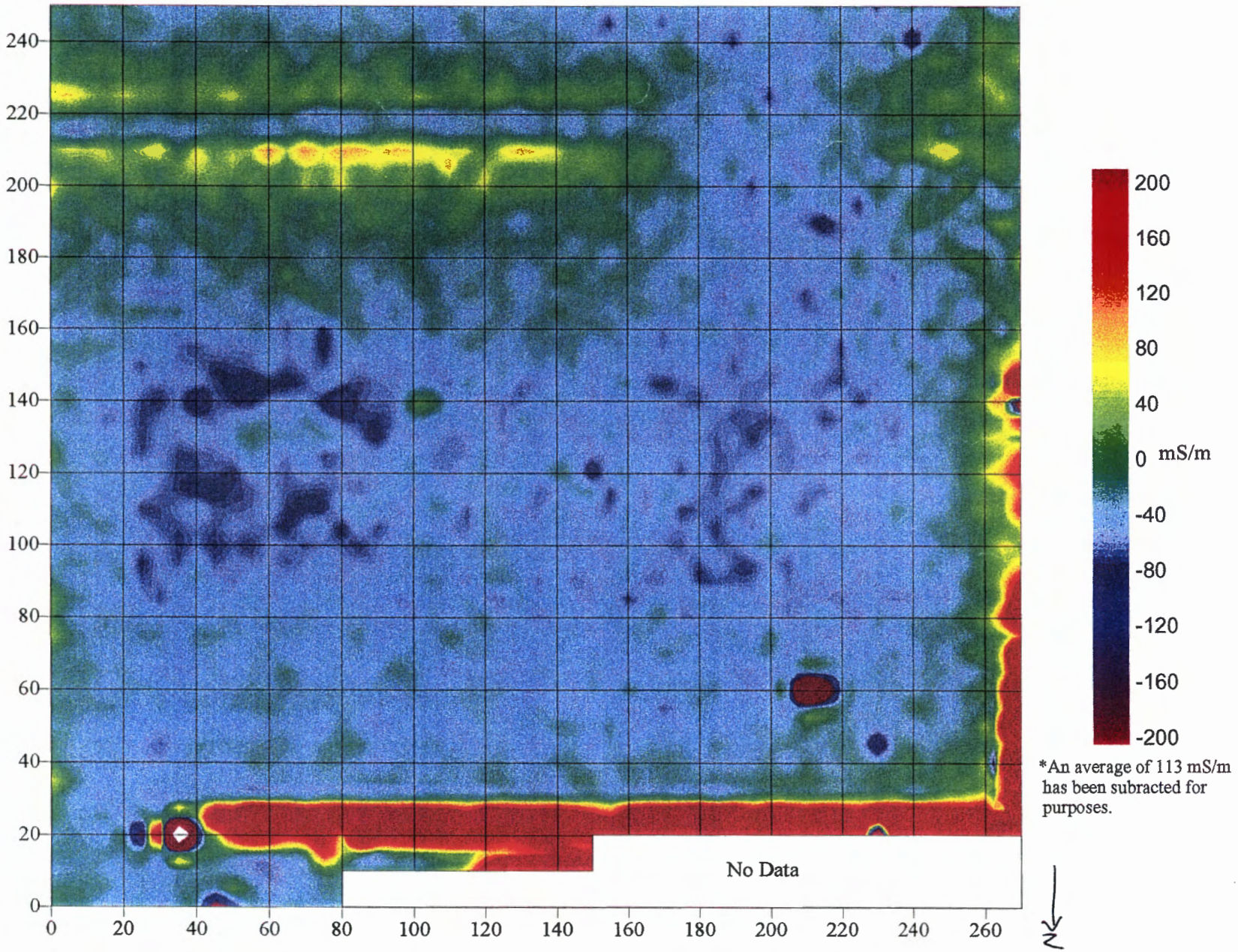


*An average of 23 mS/m has been subracted for purposes.

Plot of: dktest2-9210 Hz, Quadrature

Airport TA-73-004(c) 15,210 Hz, In-phase

Preliminary

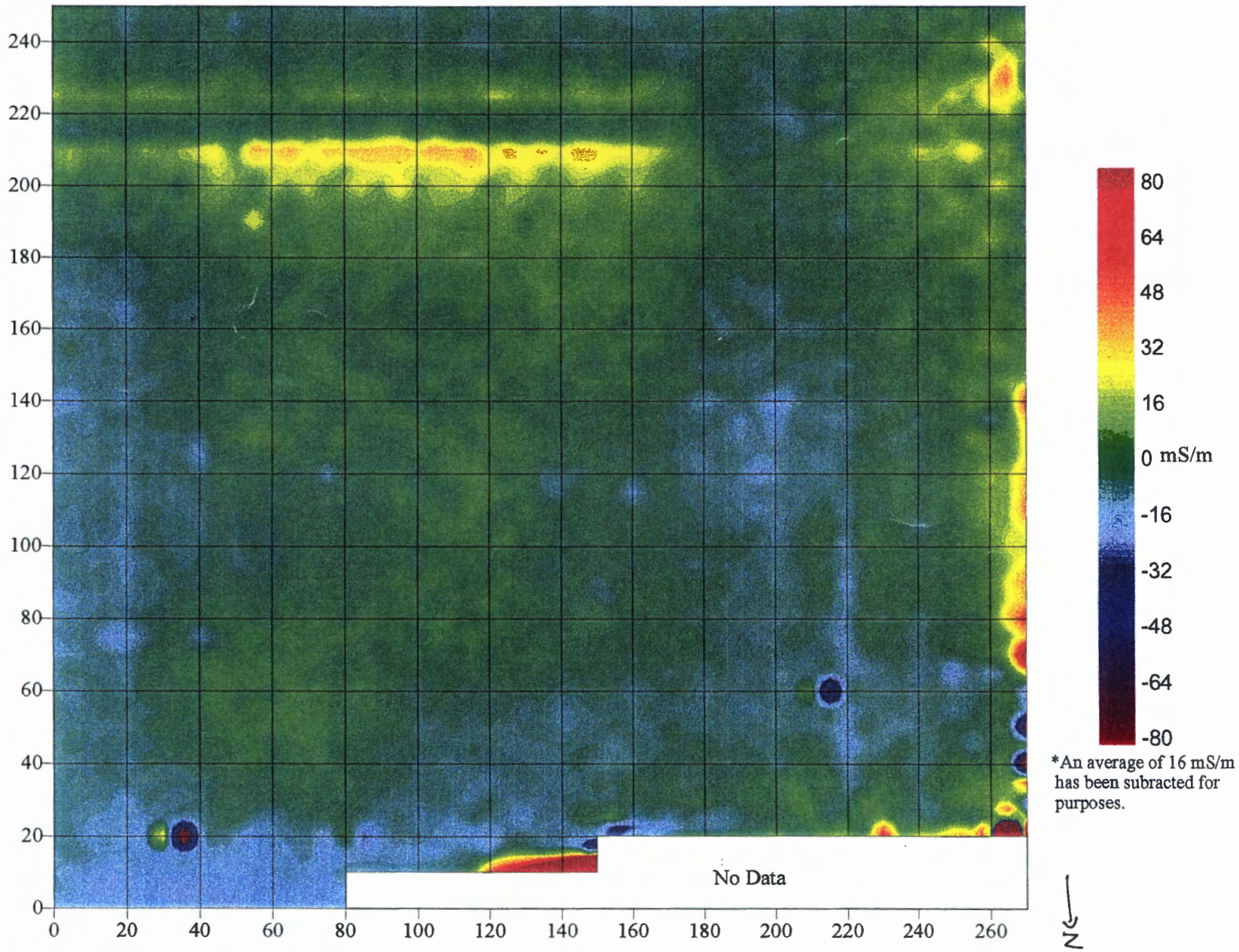


*An average of 113 mS/m has been subracted for purposes.

Plot of: dktest2-15210 Hz, In-phase

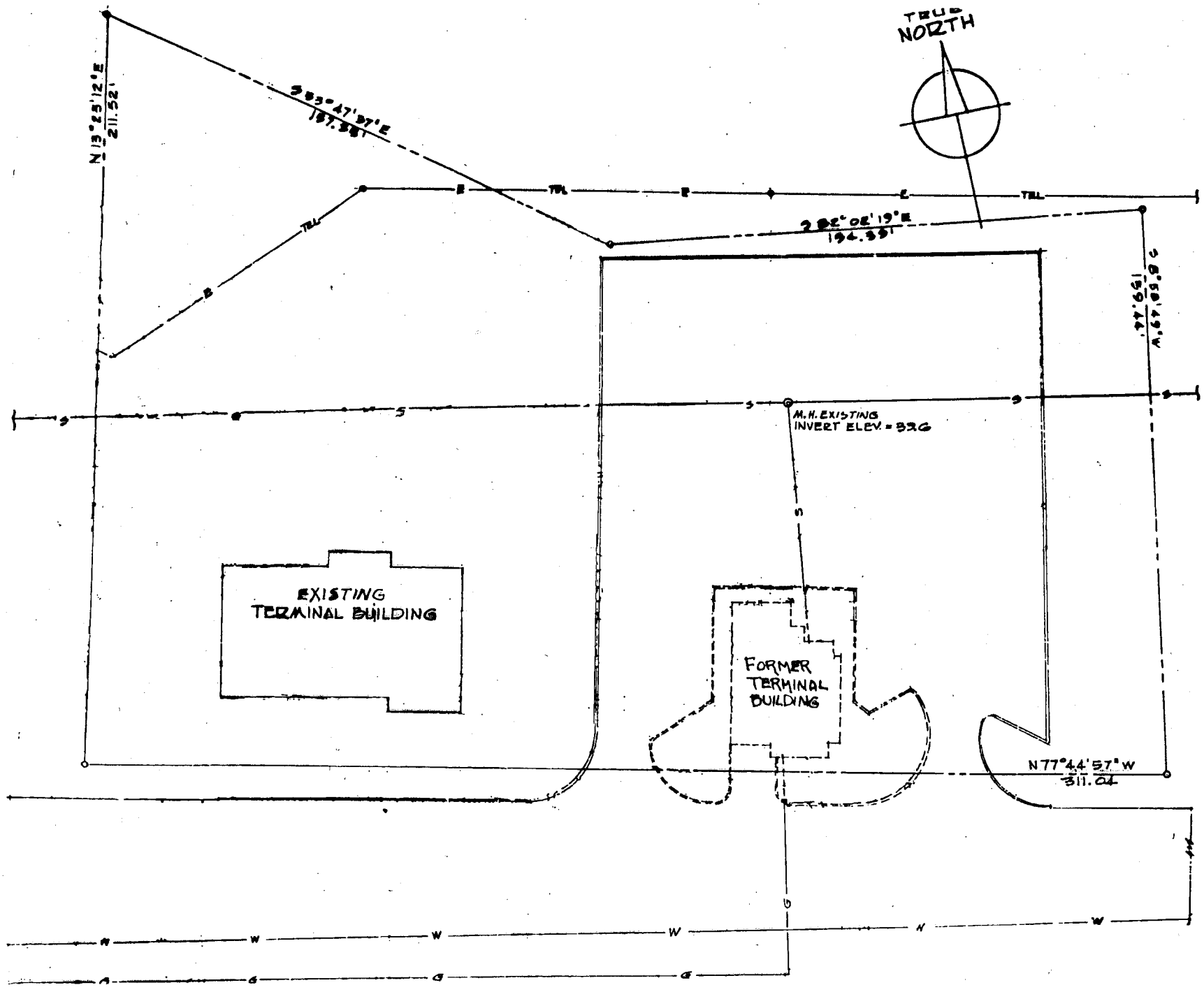
Airport TA-73-004(c) 15,210 Hz, Quadrature

Preliminary



*An average of 16 mS/m has been subracted for purposes.

Plot of: dktest2-15210 Hz, Quadrature


TRUE NORTH
N 13°23'12"E
211.52'
S 83°47'37"E
187.38'
S 82°02'19"E
194.39'
S 8°58'49"W
159.44'
N 77°44'57"W
311.04'
M.H. EXISTING
INVERT ELEV. = 32.6
EXISTING
TERMINAL BUILDING
FORMER
TERMINAL
BUILDING

Appendix A

Acronyms, Glossary, and Conversion Table

APPENDIX A ACRONYMS, GLOSSARY, AND CONVERSION TABLE

A-1.0 ACRONYMS AND ABBREVIATIONS

AOC	area of concern
ARAR	applicable or relevant and appropriate requirement
CFR	Code of Federal Regulations
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
D&D	decontamination and decommissioning
DOE	US Department of Energy
EPA	US Environmental Protection Agency
ER	Environmental Restoration (Project)
ESL	ecological screening level
HE	high explosive
HI	hazard index
HQ	hazard quotient
HWB	Hazardous Waste Bureau
HSWA	Hazardous and Solid Waste Amendments
JCNNM	Johnson Controls Northern New Mexico
Laboratory	Los Alamos National Laboratory
NFA	no further action
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
OU	operable unit
PCB	polychlorinated biphenyl
PST	petroleum storage tank
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RRES-R	Risk Reduction and Environmental Stewardship Division–Remediation Program
SAL	screening action level
SWMU	solid waste management unit
TA	technical area
TSCA	Toxic Substances Control Act
VCP	vitrified clay pipe
VOC	volatile organic compound

A-2.0 GLOSSARY

area of concern (AOC). Areas at the Laboratory that might warrant further investigation for releases based on past facility waste-management activities.

analysis. Includes physical analysis, chemical analysis, and knowledge-of-process determinations. (Laboratory Hazardous Waste Facility Permit)

chemical of potential concern (COPC). A chemical, detected at a site, that has the potential to adversely affect human receptors due to its concentration, distribution, and mechanism of toxicity. A COPC remains a concern until exposure pathways and receptors are evaluated in a site-specific human health risk assessment.

chemical of potential ecological concern (COPEC). A chemical, detected at a site, that has the potential to adversely affect ecological receptors due to its concentration, distribution, and mechanism of toxicity.

cleanup levels. Media-specific contaminant concentration levels that must be met by a selected corrective action. Cleanup levels are established by using criteria such as protection of human health and the environment; compliance with regulatory requirements; reduction of toxicity, mobility, or volume through treatment; long- and short-term effectiveness; implementability; cost; and public acceptance.

Code of Federal Regulation (CFR). A codification of all regulations developed by federal government agencies and finalized by publication in the Federal Register.

corrective action. Action to rectify conditions adverse to human health or the environment.

decommissioning. Permanent removal from service of facilities and their components, after the discontinued use of structures or buildings deemed no longer useful, in accordance with regulatory requirements and environmental policies.

decontamination. Removal of unwanted material from the surface of or from within another material.

ecological screening level (ESL). An organism's exposure-response threshold for a given chemical constituent. The concentration of a substance in a particular medium corresponds to a hazard quotient (HQ) of 1.0 for a given organism below which no risk is indicated.

Federal Register. The official daily publication for Rules, Proposed Rules, and Notices of federal agencies and organizations, as well as Executive Orders and other Presidential Documents.

groundwater. Water in a subsurface saturated zone; water beneath the regional water table.

hazard index (HI). The sum of hazard quotients for multiple contaminants to which a receptor (j) is determined to be exposed, i.e., $HI_j = \sum I\ HQ_{ij}$.

hazard quotient (HQ). The ratio of a calculated exposure (E) to or dose (D) from a given contaminant (I) to a given receptor (j) over a reference value (TRV) for contaminant (I) determined to be protective of receptor (j), i.e., $HQ_{ij} = E_{ij}$ [or D_{ij}]TRV_{ij}.

Hazardous and Solid Waste Amendments (HSWA). The Hazardous and Solid Waste Amendments of 1984 (Public Law No. 98-616, 98 Stat. 3221), which amended the Resource Conservation and Recovery Act of 1976, 42 U.S.C. § 6901 et seq.

industrial-use scenario. Industrial use is the scenario in which current Laboratory operations continue. Any necessary remediation involves cleanup to standards designed to ensure a safe and healthy work environment for Laboratory workers.

National Pollutant Discharge Elimination System (NPDES). The national program for both issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits and imposing requirements under Sections 307, 318, 402, and 405 of the Clean Water Act.

no further action (NFA). A recommendation that no further investigation or remediation is warranted based on specific criteria.

operable unit (OU). At the Laboratory, one of 24 areas originally established for administering the ER Project. Set up as groups of potential release sites, the OUs were aggregated based on geographic proximity for the purpose of planning and conducting RCRA facility assessments and RCRA facility investigations. As the project matured, it became apparent that 24 were too many to allow efficient communication and to ensure consistency in approach. Therefore, in 1994, the 24 OUs were reduced to 6 administrative "field units."

outfall. The vent or end of a drain, pipe, sewer, ditch, or other conduit that carries wastewater, sewage, storm runoff or other *effluent* into a stream.

permit modification. A request by either the permittee or the administrative authority to change a condition of the Laboratory's Hazardous Waste Facility Permit.

polychlorinated biphenyls (PCBs). Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and animals.

potential release site (PRS). Refers to potentially contaminated sites at the Laboratory that are identified either as solid waste management units (SWMUs) or areas of concern (AOCs). PRS refers to SWMUs and AOCs collectively.

RCRA facility investigation (RFI). The investigation that determines if a release has occurred and the nature and extent of the contamination at a hazardous waste facility. The RFI is generally equivalent to the remedial investigation portion of the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA) process.

receptor. A person, plant, animal, or geographical location that is exposed to a chemical or physical agent released to the environment by human activities.

release. Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of hazardous waste or hazardous constituents into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles that contain any hazardous wastes or hazardous constituents).

residential-use scenario. The standards for residential use are the most stringent of the three current- and future-use scenarios being considered by the ER Project and is the level of cleanup the EPA is currently specifying for SWMUs located off the Laboratory site and for those released for non-Laboratory use.

Resource Conservation and Recovery Act (RCRA). The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976. (40 CFR 270.2)

screening action level (SAL) — Medium-specific concentration level for a chemical derived using conservative criteria below for which it is generally assumed that there is no potential for unacceptable *risk* to human health. The derivation of a SAL is based on conservative exposure and land-use assumptions. However, if an applicable regulatory standard exists that is less than the value derived by *risk*-based computations, it will be used for the SAL.

screening assessment. A process designed to determine whether contamination detected in a particular medium at a site may present a potentially unacceptable human-health and /or ecological risk. The assessment utilizes screening levels that are either human-health or ecologically based concentrations derived by using chemical-specific toxicity information and standardized exposure assumptions below which no additional actions are generally warranted.

site conceptual model. A qualitative or quantitative description of sources of contamination, environmental transport pathways for contamination, and biota that may be impacted by contamination (called receptors) and whose relationships describe qualitatively or quantitatively the release of contamination from the sources, the movement of contamination along the pathways to the exposure points, and the uptake of contaminant by the receptors.

solid waste management unit (SWMU). Any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released. This definition includes regulated units (i.e., landfills, surface impoundments, waste piles, and land treatment units) but does not include passive leakage or one-time spills from production areas and units in which wastes have not been managed (e.g., product-storage areas).

technical area (TA). The Laboratory established technical areas as administrative units for all its operations. There are currently 49 active TAs spread over 43 square miles.

A-3.0 METRIC TO ENGLISH CONVERSION TABLE

Metric to English Conversions

Multiply SI (Metric) Unit	by	To Obtain US Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (µm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram (µg/g)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

Appendix B

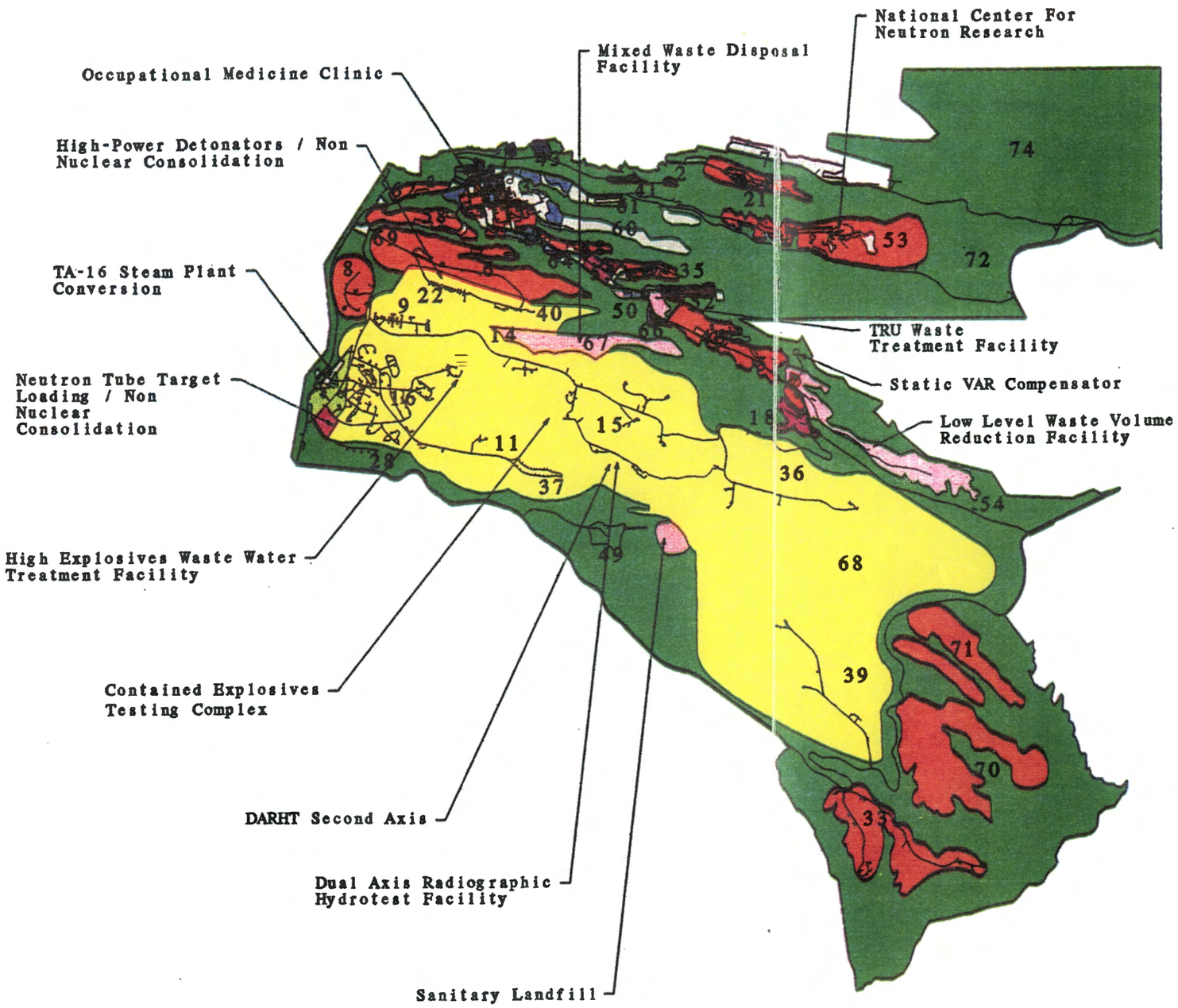
Attachments Common to More Than One SWMU

LANL FUTURE LAND USE (LABWIDE)

PREPARED FOR:
SITE DEVELOPMENT PLAN
ANNUAL UPDATE, 1995

Appendix B

Attachment 1



LEGEND

- ENVIRONMENTAL RESEARCH /BUFFER (ER)
- PHYSICAL SUPPORT AND INFRASTRUCTURE (PSI)
- EXPERIMENTAL SCIENCE (EX)
- HIGH EXPLOSIVES R&D AND TESTING (HE)
- SPECIAL NUCLEAR MATERIALS R&D (SNM)
- PUBLIC AND CORPORATE INTERFACE (PC)
- ADMINISTRATIVE AND TECHNICAL SERVICES (ATS)
- WASTE MANAGEMENT (WM)
- THEORETICAL AND COMPUTATIONAL SCIENCE (TC)
- NON-DOE LAND : POTENTIALLY PSI
- HIGH EXPLOSIVES ADMINISTRATIVE AND TECHNICAL SUPPORT AREA
- 03 TECHNICAL AREA NUMBERS
- PAVED ROADS
- DOE BOUNDARY

PREPARED BY:
LOS ALAMOS NATIONAL LABORATORY
SITE PLANNING OFFICE

DATE: 03-21-95 PHONE: 505-667-9383

FEET: 3000 0 3000 6000
METERS: 914 0 914 1828

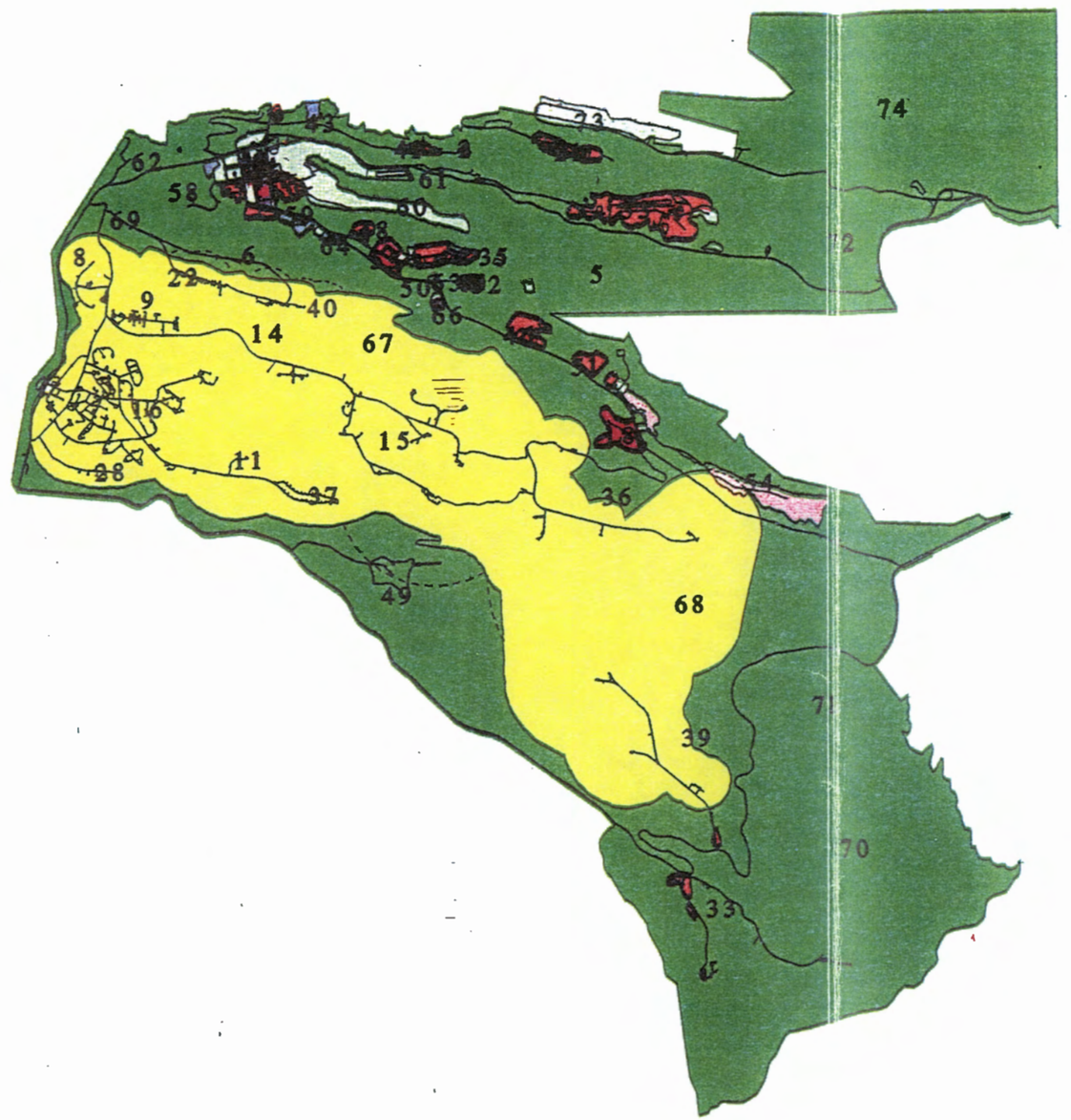
N

NEW MEXICO STATE PLANE COORDINATE SYSTEM (CENTRAL ZONE)
1927 NORTH AMERICAN DATUM

LANL EXISTING LAND USE (LABWIDE)

PREPARED FOR :
SITE DEVELOPMENT PLAN
ANNUAL UPDATE, 1995

Appendix B
Attachment 1



LEGEND

- ENVIRONMENTAL RESEARCH /BUFFER (ER)
- PHYSICAL SUPPORT AND INFRASTRUCTURE (PSI)
- EXPERIMENTAL SCIENCE (EX)
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PREPARED BY:
LOS ALAMOS NATIONAL LABORATORY
SITE PLANNING OFFICE
DATE: 03-21-95 PHONE: 505-667-9383

FEET
3000 0 3000 6000
914 0 914 1828
METERS

N

NEW MEXICO STATE PLANE COORDINATE SYSTEM (CENTRAL ZONE)
1927 NORTH AMERICAN DATUM

Appendix B
Attachment 2

Los Alamos National Laboratory

UNIVERSITY OF CALIFORNIA

Environmental Restoration Project
MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

Date: September 11, 1998
Refer to: EM/ER:98-317

ER ID # 59685

Mr. Ted Taylor
US Department of Energy
Los Alamos Area Office, MS A316
Los Alamos, NM 87545

SUBJECT: REWRITE OF CHAPTER 6 WITHIN RFI WORK PLAN FOR OU 1082 TO SATISFY PM FOR FUNCTIONAL AREA A.2

Dear Ted:

Enclosed are the results of an exercise Los Alamos National Laboratory has completed to partially satisfy Functional Area A.2 of the Fiscal Year 1998 (FY98) Performance Measures (Enclosure 1). This exercise involved a re-evaluation of 80 sites proposed for no further action (NFA) within the Resource Conservation and Recovery Act Facility Investigation (RFI) Work Plan for Operable Unit 1082, Addendum 2. This document was submitted in July 1995, and has yet to be reviewed by the Administrative Authority. At the time this document was submitted, the five NFA criteria had not been developed and accepted by the New Mexico Environment Department (NMED). The original NFA recommendations were based on human health evaluations only. Ecological risk and other applicable regulations and standards were not considered at that time.

The Environmental Restoration (ER) Project informed John Kieling of NMED of our need to meet Functional Area A.2 Performance Measure by revisiting previously proposed NFA recommendations and re-evaluating them to today's NFA standards. Dave McInroy of my staff has been working with Mr. Kieling and agreed on a process that would allow for the Laboratory to resubmit a replacement Chapter 6 for this Work Plan, which would achieve the following:

- apply the more recent NFA criteria to those sites previously proposed for NFA;
- reevaluate the proposals to include an evaluation of ecological risk and other applicable regulations and standards; and
- remove those sites from the chapter that the Laboratory believes are no longer viable NFA proposals.

Mr. Kieling asked that we not significantly modify the text at this time to reflect the new NFA format but to wait until a permit modification is generated for those proposed NFAs that NMED concurred with. Dave McInroy has discussed this approach with Joe Mose of your staff, and Joe has also concurred with this approach.

As a result of this re-evaluation exercise, the Laboratory's ER Project has determined that 72 of the original 80 proposals meet today's NFA criteria. This evaluation was performed in accordance with the ER Project's white paper entitled *Documentation of Ecological Risk Assessment and Other Applicable Regulations and Standards for Administrative No Further Action Proposals*. This is the evaluation process that your office has accepted on previous deliverables (September 30, 1997; June 29, 1998; and August 13, 1998) to meet the A.2 Performance Measure last fiscal year and earlier this fiscal year. This re-evaluation exercise adds another 72 sites to the previously submitted 119, for a total of 191 sites submitted in satisfaction of Functional Area A.2 of the FY98 Performance Measures.

Enclosed please find two tables listing HSWA and non-HSWA sites for the 72 potential release sites that have been re-evaluated. Tables 1 and 2 include:

- NFA criteria;
- PRS number and descriptions;
- former OU number;
- NFA document;
- document date; and
- NFA justification.

Also enclosed are the revised Chapter 6 for the RFI Work Plan for OU 1082, Addendum 2 and the draft transmittal letter. Upon your concurrence, the rewrite of Chapter 6 will be sent to the NMED. Mr. Kieling has held off on the review of the subject document until this re-evaluation is completed and delivered.

Per my discussion with you on September 9, 1998, and our joint memo modifying the A.2 Performance memo (EM/ER:98-335), credit for completion of this performance measure will be obtained upon submittal to and acceptance by DOE-LAAO. We will jointly determine the most efficient approach and timing for transmitting appropriate information to NMED.

Should you have any questions, please contact Dave McInroy at 667-0819.

Sincerely,

Julie A. Canepa

Julie A. Canepa, Program Manager
Environmental Restoration Project

JC/DM/rfr

Enclosures: (1) Functional Area A.2 Performance Measure
(2) Table 1, HSWA NFA PRSs
(3) Table 2, Non-HSWA NFA PRSs
(4) Draft Letter to Dr. Robert Dinwiddie
(5) Rewrite of Chapter 6 for RFI Work Plan for OU 1082, Addendum 2

Cy (w/ encs.):
D. Boak, TSA-10, MS M992
D. Daymon, EM/ER, MS M992
A. Dorries, TSA-11, MS M992
T. George, EM/ER, MS M992
D. McInroy, EM/ER, MS M992
R. Michelotti, CST-7, MS E525
J. Newlin, CST-7, MS M992
A. Pratt, EES-13, MS M992
M. Salazar, EM/ER, MS M769
RPF, MS M707, Record Package 306

Cy (w/o encs.):
EM/ER, MS M992

Appendix C

Documentation for
Varying from HSWA Permit Modification Request Outline

EM/ER Telephone Log

Call To: Kim Hill (HRMB)
827-1558, ext. 1048
Call From: Linda Nonno (EM/ER)
Date: May 4, 1999, 3:40 pm

Discussion:

I phoned Kim Hill to discuss the outline for HSWA permit modification request NFA proposals provided in HRMB's RPMP Document Requirement Guide (3/3/98). The outline in question is located in Section II.B.4.a.(4).(a) of the 3/3/98 Document Requirement Guide.

The outline works well for sites that fall under NFA Criterion 5, but many of the sections are not applicable for sites that fall under Criteria 1 through 4. I asked Kim if it would be possible to alter the outline as per the attached example that eliminates the following sections of the outline: 2.4 Investigatory Activities, 2.5 Site Conceptual Model, and 2.6 Site Assessments (human health, ecological, and other). We discussed the best place to include a site map and agreed that it should be placed in section 2.2.1, Site Description. I also suggested adding a section for supporting documentation, to which Kim agreed. In rare cases, an applicable assessment, such as surface water SOP 2.01 (formerly AP 4.5) or a UST closure report may exist for a Criterion 1 – 4 site. When applicable, such documentation will be included as an attachment in the supporting documentation section.

We agreed to put a discussion of how and why these permit modification request NFA proposals will vary from the HRMB Document Requirement guide in both the Introduction section of the permit modification request and in the cover letter for the request.

Linda Nonno

Linda Nonno

I agree that the above telephone log accurately records the May 4 telephone conversation between Linda Nonno and myself.

Kim Hill 5/18/99

Kim Hill

LMN/KH:lmn

HSWA PERMIT MODIFICATION REQUEST
NO FURTHER ACTION PROPOSALS
OUTLINE FOR NFA CRITERIA 1 THROUGH 4

EXECUTIVE SUMMARY
1.0 INTRODUCTION
2.0 Solid Waste Management Unit/Area of Concern (SWMU/AOC) X
- 2.1 Summary
- 2.2 Description and Operational History
  - 2.2.1 Site Description
    Includes a site map
  - 2.2.2 Operational History
- 2.3 Land Use
  - 2.3.1 Current
  - 2.3.2 Future/Proposed
- 2.4 No Further Action Proposal
  - 2.4.1 Rationale
  - 2.4.2 Criterion
- 2.5 Supporting Documentation

APPENDIX A LIST OF ACRONYMS AND GLOSSARY
- A-1 List of Acronyms
- A-2 Glossary